EVIDENTIARY HEARING

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)	
	)	
Application for Certification	)	Docket No.
for the Elk Hills Power	)	99-AFC-1
Project	)	

HEARING ROOM B

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

TUESDAY, JANUARY 25, 2000

10:10 a.m.

Reported By:

Debi Baker

Contract No. 170-99-001

COMMITTEE MEMBERS PRESENT

Michal C. Moore, Commissioner

Bob Eller, Commissioner Advisor

Shawn Pittard, Commissioner Advisor

Priscilla Ross, Public Adviser's Office

Major Williams, Jr., Hearing Officer

STAFF PRESENT

Kerry Willis, Staff Counsel

Marc Pryor

APPLICANT

Jane E. Luckhardt
Taylor Miller
Downey, Brand, Seymour & Rohwer

INTERVENOR

Lizanne Reynolds, CURE

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E X H I B I T S

Exhibits		For ID	Received
1	AFC		
	Land Use		21
	Transmission Line System Engineering		32
	Transmission Line Safety & Nuisance		44
	Public Health		71
	Hazardous Materials Management		180
2	Data Requests		
	Land Use		21
	Transmission Line System Engineering		32
	Hazardous Materials Management		180
4	Not Identified on Record		21
5	Not Identified on Record		21
6	Not Identified on Record		21
7	Not Identified on Record		21
8	Not Identified on Record		21
9	Not Identified on Record		21
11	Not Identified on Record		21
12	Not Identified on Record		21
13	Not Identified on Record		21
17	Transmission System Engineering		32
19	FSA		
	Land Use		25
	Transmission System Engineering		37

E X H I B I T S

		For ID	Received
Exhibits			
19	FSA Transmission Line Safety & Nuisance		48
	Public Health		90
	Hazardous Materials Management		209
21-C	Transmission System Engineering Errata 12		37
25	Public Health Testimony of Dr. Phyllis Fox	134	134

P R O C E E D I N G S

COMMISSIONER MOORE: -- and to tell you that even though it's not official, that Commissioner Rohy has departed, he is departing and is down in San Diego today. So, fortunately or unfortunately, depending on your viewpoint, I'm it, and I will be it for the rest of this case.

So with that, welcome to today's evidentiary hearing, and I am going to turn to Major for the introductions.

You'll find that I have a slightly different style than Commissioner Rohy in -- in the sense that I depend perhaps a little bit less on my Hearing Officer to run -- run things, so you'll find me asking perhaps as many questions, but also getting beat over the head a lot when I make procedural errors, which I make a number of. So that's why Major has a mallet behind here. It's the whole purpose of it, is to keep me in line.

With that, we have the -- the continuation of the evidentiary hearings, and for the Application, and for the record, the Application for Certification for the Elk Hills Power Plant, which is our Docket Number 99-AFC-1.

And we're unfortunately in Hearing Room B again, where the acoustics are horrible.

So with that, I will turn to Major to -- and today's topic list, for his introductory remarks, and any housekeeping items.

HEARING OFFICER WILLIAMS: Thank you, Commissioner Moore.

I think the first thing to do is to probably start with our housekeeping matters. I know CURE has a motion pending. We had talked about possibly introducing documents from the Sunrise case into this matter, Elk Hills, in order to alleviate voluminous filings in the record. My concern, however, is that we not intermix the cases so that we can't decipher one from the other.

And because of that concern, my inclination is to deny that motion, except to the extent that we have very discrete documents that we can possibly use that's already been filed in the Sunrise case, and it's just documents. In other words, it doesn't -- it doesn't lead to any other possible testimony or introduction by reference to other materials.

So if we can do that in the proceeding I

would be inclined to -- to keep the record fairly clean that way, if we can do it.

MS. LUCKHARDT: I have a concern about introducing documents that have not been previously filed in this case, in the Elk Hills case, and I see this in a way as another way to late file exhibits. If they had them and they were available to them at the time that they were presented in the Sunrise case, they were also available to be filed with their pre-filed testimony.

And so -- and I'm not sure we even have all of the documents that they have listed in their attached list in the motion. So I'm having a little difficulty simply accepting additional documents filed at this point in the proceeding.

MS. REYNOLDS: May -- may I speak?

HEARING OFFICER WILLIAMS: Yes.

MS. REYNOLDS: The -- the documents that we have listed are -- were all official exhibits or -- with the exception of one, which was taken official notice of, which is an EPA document, in the Sunrise hearings. As a party to that proceeding you should have received copies of all of those documents weeks -- a couple of weeks ago.

So I don't know why you wouldn't have copies of these documents.

COMMISSIONER MOORE: Well, let me see if I can -- if I can clarify. We have a couple of issues that are literally on the table as we say this. And in spite of the -- of the care that the framers of the Warren-Alquist Act took to make sure that the procedures here were as exacting and as tedious and as cumbersome as they could possibly be, in a -- in a faux mimic of the legal process, we have an issue of a Commissioner here, and a Hearing Officer, who are going to have to try and write up a decision at the end of this. That's the end product.

So if we cut to the chase here, we got a lot of stuff that has to be synthesized for my eight still working brain cells, and see if we can turn out a decision that makes sense. One.

Two. We have the issue of trying to be responsible about the amount of paper that we generate. That means that there's a lot of stuff that'll come in that can be referenced by fact or referenced, in fact, that I can take advantage of, anyone else can take advantage of, without having to drop, you know, two to three kilos of paper in

front of me and assume that I'll be able to read it, all that.

Which means that as a practical matter, there may be some cases where something can be referenced and simply filed electronically, and doesn't have to be put in -- in voluminous paper detail.

Next point is that where this information, as a practical matter, has already been discussed with the Committee, literally the same Committee Member, in front of him, references to things that have been filed or that have already been argued can be made to re-enlighten us or give us some guidance.

On the other hand, where something was filed, and I see Dr. Fox in front of us, and where there were extensive debates about material that Dr. Fox brought in front of us, but which this party, this Applicant did not have a chance to argue against, not really, or -- or wasn't -- or might have taken a different tack than attorneys for the Petitioners in that case, I have no interest in denying that opportunity. That wouldn't be well served at all.

So where you want to repeat an argument

that was made before, do that without -- I ask you to do that without going into detail. Where you want to invent a new argument or you have something that's different to say, you bet, we'll hear it all the way to the end, and we'll ask someone like Dr. Fox to defend their point and -- and get it all on the record.

I'm just saying where we already have testimony regarding an item going back and forth on something that's very, very detailed, like chemistry or soil chemistry, or -- or atmospheric chemistry, let's not reinvent the wheel. Give me the reference points. I assure you I'll go back, I'll find those reference points, and I -- I will deal with them.

Where you have a new point to make, make them. Let's get it on the record in whatever detail it takes to make it -- to make it clear.

So that's what Major is saying. He's, in a sense, denying the request, but we're asking for your cooperation so we don't -- so we get an intelligent record, and we get something that we can make a reasonable decision based on. That's -- that's all -- let's be practical. Let's not take this to the absurdity of -- of the process at

its very, very end.

MS. REYNOLDS: Could I ask for a clarification --

COMMISSIONER MOORE: Yes, ma'am.

MS. REYNOLDS: -- on Major Williams' ruling. What -- was your ruling no transcript, yes documents, or what?

HEARING OFFICER WILLIAMS: I think we can have both transcripts and documents where it's essentially agreed upon. If there's an objection from the Applicant, then I'm inclined not to -- not to allow either transcripts or documents based on the objection. I think in all fairness we have to give the Applicant that -- that favor.

COMMISSIONER MOORE: Right. But she has to make their own case. Clearly. This is not the previous case. It just happens to be in the same area, with a lot of the same features.

Staff, other -- any housekeeping, or responses to that?

MS. WILLIS: No. I think one of the things that my -- my concern was reviewing the testimony last night that was submitted, it would be helpful if there were page and line -- if there was some marking or some -- some identification

when we're referencing it, because there was -- there was a lot of extraneous discussion that doesn't pertain to this case kind of mingled in with some general background that probably doesn't need to be repeated.

So I think if that background information can be at least identified and pulled out, that would be helpful.

HEARING OFFICER WILLIAMS: Okay.

COMMISSIONER MOORE: Let me remind everyone, when you're in this hearing room, these microphones do not amplify. They only record. So you have to use a little bit of a stage trick and talk to the other side of the room in order to self-amplify, to get it across. Because there's a lot of people who want to hear what you're hearing.

Jane, you look like you're expectantly waiting to get something on the record.

MS. LUCKHARDT: Well, I -- to tell you the truth, I'm trying to think through whether -- I guess at this point we're registering our objection to the motion as it is filed right now, their -- their motion for the specific documents and the whole range of transcript sections that

they have identified.

So what I heard Major Williams say, and if I'm incorrect help me out, was that if -- if they introduce something and we don't object, then it will come in. And so I guess I'm objecting to what they've asked for to this point, so then if they want to bring in something different, then they need to express that so that we can react to that.

I think that's where I'm at.

HEARING OFFICER WILLIAMS: Okay. I think, based upon that, that everybody's clear on what we're going to do. Okay.

I would state for the record that all parties who were here at the previous hearing are here again, except for -- except for Commissioner Rohy, who is unavailable today. But his Advisor, Bob Eller, is here, and Commissioner Moore's Advisor, Shawn Pittard, is -- is not here.

Other than -- other than those folks that I've named, everyone is here who was here at the previous hearing.

I would also note for the record that Priscilla Ross is here from the Public Adviser's Office.

Are there any people here interested in these proceedings, in the audience, who are either public members or other interested members, we would ask that you identify yourself for the record, as well.

Seeing none, we'll move on.

On December 22nd, 1999, the Committee issued a notice scheduling today's hearing. During the course of today's hearing the Committee will take occasional short recesses, as well as a lunch break, to be announced later.

The notice indicated that the scheduled hearings on January 20, 25, 27, and if needed, February 1st, 2000, to cover many of our topics.

On January 20th we completed ten topics, although we shifted the subtopic of Water Injection Wells from Geology to Soil and Water Resources, to be heard on Tuesday, March 7, 2000.

Evidentiary Hearings are formal in nature, similar to court proceedings. The purpose of the hearing is to receive evidence, including testimony, and to establish the factual record necessary to reach a decision in this case.

Applicant has the burden of presenting sufficient substantial evidence to support the

findings and conclusions required for certification of the proposed facility.

The order of testimony will be taken as follows for each topic. The Applicant, Staff, CURE, and the Cal-ISO.

First we will hear testimony on Land Use; then Transmission System Engineering; Transmission Line Safety and Nuisance; Public Health; and finally Hazardous Materials Management. Does that comport with what the parties believe to be the order?

I would like to remind the parties that witnesses will testify under oath or affirmation. During the hearings, the party sponsoring the witness shall establish the witness's qualifications and ask the witness to summarize the prepared testimony. Relevant exhibits should be offered into evidence at that time.

At the conclusion of a witness's direct testimony, the sponsoring party should move in all relevant exhibits to be received into evidence.

The Committee will next provide the other parties an opportunity for cross examination, followed by redirect and recross examination as appropriate. Multiple witnesses

may testify as a panel. The Committee may also question the witnesses.

Upon conclusion of each topic area, we will invite members of the public to offer unsworn public comment. Public comment is not testimony, and a Committee finding cannot be based solely on such comments. However, public comment may be used to explain evidence in the record.

Are there any questions so far?

I previously passed out an updated exhibit list to the parties. And I believe we have one exhibit that we -- I will mark at this time. It's the staff's Transmission System Engineering Errata, one page, and I see here that -- that the top portion of the page, where it refers to page 339 of the Transmission System Engineering testimony, has been -- has been marked out. So that's -- that's no longer there, so the exhibit begins with page 342, the changes to the conditions of certification.

We'll mark that as 21, next in order. I think it's 21-C.

(Thereupon, Exhibit 21-C was marked for identification.)

HEARING OFFICER WILLIAMS: And I'd like

the parties to make any changes to the exhibit list, and let's try to keep it up to date. If you see a problem with it, let me know, and I'll do my best to keep it -- to keep it going, and accurate.

We now begin with Applicant's witness on Land Use.

MS. REYNOLDS: Mr. --

HEARING OFFICER WILLIAMS: Excuse me.

MS. REYNOLDS: I'm sorry, Mr. Williams. I have one correction, one brief correction to the exhibit list.

HEARING OFFICER WILLIAMS: Okay.

MS. REYNOLDS: Exhibit 23, the testimony of Dave Dominguez, was sponsored by CURE, not the Applicant.

HEARING OFFICER WILLIAMS: Okay. Thank you.

MS. REYNOLDS: Exhibit 22 was also sponsored by CURE. It has a blank there right now.

HEARING OFFICER WILLIAMS: Okay. Thank you very much, Ms. Reynolds.

Okay. Court Reporter, would you swear the Applicant's --

MS. LUCKHARDT: Actually, both of these

individuals were sworn in the last proceeding. Would you like them re-sworn --

HEARING OFFICER WILLIAMS: Okay.

MS. LUCKHARDT: -- at this point, or --

HEARING OFFICER WILLIAMS: No.

MS. LUCKHARDT: Okay.

HEARING OFFICER WILLIAMS: Let's proceed.

MS. LUCKHARDT: All right. The Applicant's witnesses in the area of Land Use are Mr. Dennis Champion, Mr. Dwight Mudry. Both of them have had their qualifications previously filed in this proceeding.

TESTIMONY OF

DENNIS CHAMPION AND DWIGHT MUDRY

called as witnesses on behalf of the Applicant, having been previously duly sworn, were examined and testified as follows:

DIRECT EXAMINATION

MS. LUCKHARDT: Mr. Champion, would you please identify the exhibits you are sponsoring in your testimony today?

MR. CHAMPION: I'll be sponsoring Exhibit 1, the AFC.

COMMISSIONER MOORE: Mr. Champion, I'm

going to ask you to speak up, please, and kind of -- only -- the room just absorbs sound.

MR. CHAMPION: Yes, sir. Along with Dwight Mudry, I'll be sponsoring AFC Section 5.7, Land Use, Sections 518.1, 518.2, 518.3, and 518.4. And in addition, Section 6.5.7 in the Land Use Section, and Appendix O.

MS. LUCKHARDT: And are you sponsoring part of Exhibit 2, Responses to Staff Data Requests, as well?

MR. CHAMPION: Yes, I am.

MS. LUCKHARDT: And could you identify those numbers for the record?

MR. CHAMPION Staff Data Requests 52 through 55, filed September 24th, '99.

MS. LUCKHARDT: And are you sponsoring other exhibits, as well?

MR. CHAMPION: Yes, I am. Exhibits 4, 5, 6, 7, 8, 9, 11, 12, and 13.

MS. LUCKHARDT: And do you have any changes to make to your testimony this morning?

MR. CHAMPION: No, I don't.

MS. LUCKHARDT: And do you adopt those exhibits as your true and sworn testimony?

MR. CHAMPION: Yes, I do.

MS. LUCKHARDT: Thank you.

Mr. Mudry, would you please identify the exhibits you are sponsoring this morning?

MR. MUDRY: Yes. I'm sponsoring those sections of the Land Use -- of the AFC that deal with Land Use, which are Sections 5.7, 5.18.1, 5.18.2, 5.18.3, and 5.18.4. Also, Section 6.5.7, on LORS for Land Use, and Appendix O, which is the list of surrounding property owners.

MS. LUCKHARDT: And are you also sponsoring portions of Applicant's Responses to Staff's Data Requests?

MR. MUDRY: Yes. Along with Dennis Champion, I'm sponsoring Data Request Numbers 52 through 55.

MS. LUCKHARDT: Are you sponsoring any further testimony in this proceeding?

MR. MUDRY: Yes, I'm sponsoring Attachment A, which was previously filed with my testimony.

MS. LUCKHARDT: And do you adopt these exhibits and this testimony as your true and sworn testimony in this proceeding?

MR. MUDRY: Yes, I do.

MS. LUCKHARDT: Could you please

summarize the Applicant's Land Use testimony?

MR. MUDRY: Yes. I'd like to make a brief summary on Land Use, and I'd like to use the two diagrams that I've placed on the wall, if I could.

The two figures that are on the wall are Figure 3.2.1, which is the location of the power plant components. And the other figure is 5.15-2, which happens to be population census tracks, and population density and sensitive receptors. These are both in the same scale. The only reason I --

COMMISSIONER MOORE: By the way, you're referring to a set of maps on the wall, and those maps are reproduced in your documents --

MR. MUDRY: They are --

COMMISSIONER MOORE: -- as well?

MR. MUDRY: They are in the AFC. Yes, sir.

COMMISSIONER MOORE: They are in the AFC? And could we make sure that at the end of this testimony we get a reference to those maps so that the transcript is complete.

MS. LUCKHARDT: I -- Mr. Mudry, could you repeat again the figure numbers from the Application for Certification of the maps you are

referring to on the wall?

MR. MUDRY: Yes. The two figures on the wall are 3.2-1, and 5.15-2.

COMMISSIONER MOORE: Thank you.

MR. MUDRY: These are both in the same scale, and the reason I used the two was because the second map here shows the power plant in the center of the map, so you can see the area completely surrounding it. The first map shows the power plant, plus the features.

The power plant location is on a previously disturbed industrial site, and roughly in the center of the Elk Hills oil and gas field. On this second map, which is 5.15-2, most of this area surrounding the power plant is all within the Elk Hills oil and gas field.

To give you a scale, the circle's six miles in radius, or from here to here, it's 12 miles. Most of what is in this circle is actually part of the Elk Hills oil and gas field. With the exception of Elk Hills Road, which runs north and south, the entire Elk Hills oil and gas field is -- is closed to public access and is fenced around the outside. The one access through the center is Elk Hills Road, a public road.

Construction activities of the power plant site will be temporary and will be conducted with minimal interference with the surrounding land use, which is oil and gas. The proposed power plant is compatible with the land uses in this particular area, and will not result in a significant impact to surrounding land uses. The nearest residence is over -- is about 5.1 miles away. It's actually located way up here, northeast -- north, northeast of the project site.

There are two transmission line alternatives, 1-A and 1-B. Transmission line alternate 1-A is entirely within the Elk Hills oil and gas field. It's about nine miles long. 1-B runs north, and about four miles of it is in the Elk Hills oil and gas field, then there's some undeveloped property, and about four miles of it is in rural and -- rural residential and farming -- agricultural.

COMMISSIONER MOORE: And you're now speaking of Exhibit --

MR. MUDRY: Yes, I'm speaking from Exhibit 3.2-1, which shows the project components on it.

There are two other components --

actually, three other components. There is a waste -- I mean, a water supply pipeline, which is approximately 9.8 miles in length, and all but 1.3 miles is within the Elk Hills oil and gas field. The remainder 1.3 miles is in an undeveloped area.

There is a wastewater line, which is 4.4 miles in length, and that is entirely within the Elk Hills oil and gas field. And then there is a gas supply line, which is about 25 or 100 feet, and that as well is within the oilfield.

Land use impacts associated with the power plant construction and operation will not significantly impact land use in the area.

MS. LUCKHARDT: That concludes our direct testimony. I would like to now offer the exhibits, Applicant's exhibits on Land Use into -- into the record.

HEARING OFFICER WILLIAMS: Any objections?

MS. REYNOLDS: No.

MS. WILLIS: No.

HEARING OFFICER WILLIAMS: Okay. Those exhibits are accepted into the record.

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(Thereupon, the Land Use portions of Exhibits 1, 2, 4, 5, 6, 7, 8, 9, 11, 12, and 13 were received into evidence.)

MS. LUCKHARDT: Thank you. The witnesses are now available for cross.

MS. REYNOLDS: No questions.

MS. REYNOLDS: We have no questions.

HEARING OFFICER WILLIAMS: Okay. Thank you.

Staff, you may proceed.

MS. WILLIS: Staff calls Amanda Stennick.

HEARING OFFICER WILLIAMS: Would you swear the witness, please.

(Thereupon, Amanda Stennick was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

MS. STENNICK: Yes.

TESTIMONY OF

AMANDA STENNICK

called as a witness on behalf of the Commission staff, having been first duly sworn, was examined and testified as follows:

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DIRECT EXAMINATION

BY MS. WILLIS:

Q Could you please state your name for the record?

A Amanda Stennick.

Q Did you prepare the section of the Final Staff Assessment entitled Land Use?

A Yes, I did.

Q And that -- the Final Staff Assessment has already been identified as Exhibit 19.

Did you include in Exhibit 19 a statement of your qualifications?

A Yes, I did.

Q Do you have any changes or corrections to your testimony today?

A No.

Q And do the opinions in your testimony represent your best professional judgment?

A Yes, they do.

Q Could you please provide a brief summary of your testimony?

A The project site is designated mineral petroleum in the Kern County General Plan. The site is zoned limited ag, A-1. Based on policies in the County General Plan, the project is

compatible with this land use designation and the zoning designation.

The proposed transmission line route will cross lands zoned exclusive ag and limited ag. The Kern County Zoning Ordinance states that transmission lines, resource extraction and energy development uses in these zones are permitted by right, and require no discretionary permits from the county.

However, a power plant is a conditional use in this zone, and to satisfy certain provisions of Chapters 19 of the Kern County Zoning Ordinance, Energy Commission staff has required the Applicant to prepare a site development plan that includes provisions to satisfy the requirements of the Kern County Zoning Ordinance, and that's -- those are represented in Land Use 1.

Elk Hills also proposes to lease a 12 acre portion of a 640 acre parcel of record from Occidental of Elk Hills. Therefore, certain requirements of the subdivision map act apply to the project. Kern County has stated that they will review the Applicant's application for a lot line adjustment when the lease with OEHI is

recorded in January of 2000.

In addition, Elk Hills is required to seek approval from FAA for Federal Air Regulations Part 77, for replacement of existing poles and lattice towers in the airport approach height combining district for all transmission line variation, Route 1-B. Elk Hills received a determination of no hazard to air navigation from the FAA on December 2nd, 1999.

I find that with eventual approval of the lot line adjustment and proposed condition of certification Land 1, Elk Hills will comply with all federal, state, and local applicable laws, ordinances, regulations, standards, plans and policies.

Q Does that conclude your testimony?

A Yes, it does.

MS. WILLIS: At this time, staff would like to move the Land Use section of the FSA into the record.

HEARING OFFICER WILLIAMS: Any objection?

MS. LUCKHARDT: No objections.

MS. REYNOLDS: No.

HEARING OFFICER WILLIAMS: Those will be

so moved.

(Thereupon, the Land Use sections of Exhibit 19 were received into evidence.)

MS. WILLIS: And Ms. Stennick is now available for cross examination.

COMMISSIONER MOORE: I have a question before cross starts. And that is, you referred to a lease that was coming up in January 2000. We're almost through January 2000, and I have to ask you, do you have any knowledge of whether that lease is complete or not?

THE WITNESS: I have no further knowledge of the lease being recorded, or the lot line adjustment being heard by the county.

COMMISSIONER MOORE: Did you ever see a schedule that it was in front of the planning commission at the county, or the Board of Supervisors?

THE WITNESS: I -- I spoke with Jake Sweeney, who's a planner in Kern County, and he told me that the -- that the county would schedule the -- the lot line adjustment when -- when the lease has been recorded.

COMMISSIONER MOORE: And does the county consider that kind of lot line adjustment a

ministerial act?

THE WITNESS: It's a categorical exemption for them. The use would -- would continue to be the same. It does not require a tentative map or a final map, so it's primarily ministerial.

COMMISSIONER MOORE: Good. Thank you.

Cross examination.

MS. LUCKHARDT: We have no questions.

MS. REYNOLDS: No cross.

HEARING OFFICER WILLIAMS: Okay. Seeing no questions, I believe that will conclude the presentation on Land Use. And the record will be closed on Land Use.

Thank you.

We will next -- proceed to the next topic.

I would note for the record, as well, that Mr. Shawn Pittard is here. And is the Cal-ISO -- Cal-ISO here? Okay. Cal-ISO is here, as well.

The Applicant may proceed on Transmission System Engineering.

MS. LUCKHARDT: The Applicant's witnesses in the area of Transmission System

Engineering include Mr. Joe Rowley and Mr. William Engelbrecht. Mr. Rowley has previously been sworn. Mr. Engelbrecht needs to be sworn.

HEARING OFFICER WILLIAMS: Would you swear the witness, please.

(Thereupon, William R. Engelbrecht was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

MR. ENGELBRECHT: I do.

TESTIMONY OF

JOSEPH H. ROWLEY AND WILLIAM R. ENGELBRECHT

called as witnesses on behalf of the Applicant, having been first duly sworn, were examined and testified as follows:

DIRECT EXAMINATION

MS. LUCKHARDT: I'll start with Mr. Engelbrecht.

Mr. Engelbrecht, please state your name and title for the record.

MR. ENGELBRECHT: Yes. My name is William R. Engelbrecht. And I'm Director of Business Development for Sempra Energy Resources.

MS. LUCKHARDT: Mr. Engelbrecht's qualifications have previously been filed.

Mr. Engelbrecht, will you please identify the exhibits you are sponsoring today?

MR. ENGELBRECHT: Yes. I am co-sponsoring with Mr. Rowley portions of Exhibit 1, those portions being Section 4, which is Safety and Reliability, and also Appendix 1, which provides information regarding Transmission System Engineering.

I'm also co-sponsoring with Mr. Rowley Exhibit 2, which are responses to Staff Data Requests 40 through 44, and Number 79, including the addenda to 41 and 42 dated August 23rd, 1999.

I'm also co-sponsoring with Mr. Rowley Exhibit 17, which is the further PG&E Interconnection Study addressing Transmission System Engineering issues.

MS. LUCKHARDT: Do you have any corrections to make to your testimony at this time?

MR. ENGELBRECHT: No, I do not.

MS. LUCKHARDT: And do you adopt that testimony as your true and sworn testimony?

MR. ENGELBRECHT: Yes, I do.

MS. LUCKHARDT: Thank you.

And Mr. Rowley, would you please

identify the exhibits that you are sponsoring today?

MR. ROWLEY: I'm co-sponsoring with Mr. Engelbrecht the same exhibits that he listed.

MS. LUCKHARDT: And do you have any corrections to make to those exhibits?

MR. ROWLEY: No, I do not.

MS. LUCKHARDT: And do you adopt that testimony as your true and sworn testimony?

MR. ROWLEY: Yes.

MS. LUCKHARDT: Mr. Rowley, would you please summarize your testimony for the record?

MR. ROWLEY: The most recent study performed by PG&E includes both the La Paloma and Sunrise Projects in the study baseline. The study evaluates three interconnection alternatives known as Route 1A, Route 1B, and the Route 1B variation in this proceeding. In the study they're identified -- in the same order, it would be Route 2, Route 1, and Route 3.

The scope of the study was defined with in put from the California ISO, and then the -- the study was provided to the California ISO for their review and input to this Application for Certification process.

The study results show that Route 1A and Route 1B, that for both of those routes that no system upgrades are required downstream of the first point of interconnection. The Route 1B variation, which physically is essentially the same physical route as Route 1B, is different electrically than Route 1B, and the Route 1B variation does present the possibility of a system upgrade downstream of the first point of interconnection, that being 115 to 70 KV transformer capacity at Taft Substation, where the transformer is -- is overloaded a few percent.

We're in agreement with the proposed conditions of certification in -- in the Final Staff Assessment. And that concludes my summary.

MS. LUCKHARDT: And, Mr. Rowley, I believe you were here when Mr. Mudry gave his summary of the Land Use testimony?

MR. ROWLEY: Yes.

MS. LUCKHARDT: And can you explain why the Route 1B variation is not shown on that map, the -- the map I'm identifying as Figure 3.2-1 of the AFC?

MR. ROWLEY: In one of our data responses we filed a similar map that shows the 1B

variation, but at this scale, viewed at this distance from -- from the board, you would be hard pressed to distinguish a physical difference between Route 1B and the 1B variation. They're very close to each other, and parallel to each other the entire route.

MS. LUCKHARDT: Thank you.

That concludes our direct testimony, so at this time I would like to offer Applicant's Exhibits on Transmission System Engineering into the record.

HEARING OFFICER WILLIAMS: Are there any objections?

MS. WILLIS: None.

MS. REYNOLDS: No.

HEARING OFFICER WILLIAMS: Sir, I'm speaking to the Cal-ISO. Would you identify yourself for the record, please?

MR. DASCHMANS: My name is Ron Daschmans. I'm a planner with the California ISO.

HEARING OFFICER WILLIAMS: Thank you much.

Okay. Seeing no objections, those exhibits are received into evidence.

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(Thereupon, the Safety and Reliability Transmission System Engineering portion of Exhibit 1, Data Requests 40 - 44 and 79 of Exhibit 2, and the Transmission System Engineering Portion of Exhibit 17 were received into evidence.)

MS. LUCKHARDT: The witnesses are now available for cross.

MS. WILLIS: Staff has no questions.

MS. REYNOLDS: No questions.

HEARING OFFICER WILLIAMS: Seeing no questions, I assume that concludes your presentation?

MS. LUCKHARDT: That concludes our --

HEARING OFFICER WILLIAMS: Staff?

MS. WILLIS: Shall we just address our own witness at this time?

HEARING OFFICER WILLIAMS: Yes.

MS. WILLIS: Staff calls Mark Hesters.

COMMISSIONER MOORE: Is he sworn?

MR. HESTERS: I need to be sworn.

HEARING OFFICER WILLIAMS: Would you swear the witness, please.

(Thereupon, Mark Hesters was, by the reporter, sworn to tell the truth,

the whole truth, and nothing but the truth.)

TESTIMONY OF

MARK HESTERS

called as a witness on behalf of the Commission staff, having first been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. WILLIS:

Q Could you please state your name for the record?

A My name is Mark Hesters.

Q And did you prepare the section of the Final Staff Assessment entitled Transmission System Engineering?

A Yes, I did.

Q And that has been identified previously as Exhibit -- part of Exhibit 19. Did you also include in Exhibit 19 a statement of your qualifications?

A Yes.

Q Do you have any changes or corrections to your testimony today?

A Yes, I do. It's different than the paper copy. We had some problems with the files

that are on our system here, and what was actually sent out.

Q Just one second. For the record, the changes have been previously identified as Exhibit 21C.

A The changes, page 339 does not need to be changed, that's correct in the testimony. On page 342, under Condition of Certification, TSE-1, the labeling for the bullets is incorrect. In the testimony they're labeled as 1 through 9. Instead, they should be labeled as A through I. That's just to make them consistent with what is in the -- in the rest of the testimony in the text.

Q And with these changes are the facts contained in your testimony true and correct?

A Yes.

Q And do the opinions contained in your testimony represent your best professional judgment?

A Yes.

Q Could you please provide a summary of your testimony?

A Yes, I have a brief summary.

The Elk Hills Power Company -- am I too

-- the Elk Hills Power Company has proposed to connect the Elk Hills Power Project to the existing electric network through one of three transmission line route alternatives. These are labeled in the testimony Transmission Line Route 1A, Transmission Line Route 1B, and Transmission Line Route 1B Variation.

Route 1A is a nine mile line that connects to a -- what would be a new Elk Hills switching station that loops into the existing Midway Wheeler Ridge 230 kilovolt transmission line. Transmission Line Route 1B is an 8.6 mile route that connects the power plant directly to the Midway substation. Transmission Line Route 1B Variation follows basically the same route as Transmission Line Route 1B, but instead of parallelling the existing Midway-Taft 115 kilovolt line it would replace the existing line with a 230 -- double circuit 230 kilovolt line.

Based on the Cal-ISO's assessment, interconnection of the Elk Hills Project via alternative Routes 1A and 1B meets applicable reliability criteria if Elk Hills participates in the existing Path 15 remedial action scheme, and a new Midway 500 to 230 KV RAS scheme, or remedial

action scheme. No downstream facilities are required for Routes 1A or 1B.

The Route 1B variation also meets applicable reliability criteria if Elk Hills participates in the Path 15 and the Midway 500 to 230 KV RAS scheme, and if additional 115 to 70 kilovolt transformer capacity is provided for the Taft Substation.

I have evaluated the proposed power plant substation output line and termination facilities for all three proposed line routes, and find that with the recommended conditions of certification the project complies with all applicable laws, ordinances, regulations and standards.

Q Does that conclude your testimony?

A Yes.

MS. WILLIS: At this time staff would like to introduce the section of the FSA entitled Transmission System Engineering into Exhibit 19, and then also enter Exhibit 21C.

HEARING OFFICER WILLIAMS: Any objection?

MS. LUCKHARDT: No objection.

MS. REYNOLDS: No objection.

HEARING OFFICER WILLIAMS: So admitted.

(Thereupon, the Transmission System Engineering portion of Exhibit 19 and Exhibit 21-C were received into evidence.)

MS. WILLIS: Mr. Hesters is now available for cross examination.

MS. LUCKHARDT: No cross.

MS. REYNOLDS: No cross.

HEARING OFFICER WILLIAMS: Thank you.

Okay. Moving along, then, does that conclude the --

MS. WILLIS: That concludes Mr. Hesters' testimony.

HEARING OFFICER WILLIAMS: Does that conclude your presentation, as well?

We will then move on to Mr. Daschmans. For the record, I believe that's spelled D-a-s-c-h-m-a-n; is that correct?

MR. DASCHMANS: And "s". An "s" at the end. That's correct.

HEARING OFFICER WILLIAMS: Why don't you spell it.

MR. DASCHMANS: The last name is spelled D-a-s-c-h-m-a-n-s.

HEARING OFFICER WILLIAMS: I believe the parties have received Mr. Daschmans' testimony, and the documentation associated with his testimony. So Mr. Daschmans, perhaps you want to provide a summary of --

(Thereupon, Ron Daschmans was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

TESTIMONY OF

RON DASCHMANS

called as a witness herein, having been first duly sworn, was examined and testified as follows:

MR. DASCHMANS: To briefly summarize my testimony, Pacific Gas and Electric Company has performed several technical studies on options to interconnect the Elk Hills Power Project into the ISO control grid. They assessed three options which were described by Joe Rowley and Mark Hesters, which include a 230 KV express generation outlet to Midway Substation, a loop in to the 230 Midway Wheeler Ridge line, and a variation to the first alternative which would convert an existing 115 KV line to 230 and tie in to Midway.

The testimony goes over what studies -- or is an overview of the studies that PG&E has

performed, and a summary of the conclusions which, as Mark Hesters stated earlier, indicate that no downstream facilities are required for the express generation outlet alternative nor the Midway Wheeler Ridge loop.

The variation to the first alternative, however, would require some sort of mitigation on the Taft 115 to 70 KV transformer, which could either be a remedial action scheme, or the replacement or an addition of additional transformer

The conclusion of the ISO is that we are prepared to approve all three of the interconnection -- transmission interconnection alternatives for the Elk Hills Power Project.

COMMISSIONER MOORE: Your last statement means that any of the three are acceptable?

MR. DASCHMANS: They are viable alternatives and they do not compromise system reliability if the follow the conditions.

COMMISSIONER MOORE: An do any of them have a greater weight or ranking with the ISO?

MR. DASCHMANS: No, they do not.

COMMISSIONER MOORE: So there's none -- no one of those alternatives is preferable to any

other?

MR. DASCHMANS: Correct.

COMMISSIONER MOORE: Thank you. That concludes your testimony?

MR. DASCHMANS: Yes, it does.

COMMISSIONER MOORE: Do you have cross examination from the Applicant?

MS. LUCKHARDT: No questions.

COMMISSIONER MOORE: Staff?

MS. WILLIS: No questions.

MS. REYNOLDS: No questions.

HEARING OFFICER WILLIAMS: Okay. I think, then, that there's just the matter of introducing the -- the testimony into the record, the filed testimony.

MS. LUCKHARDT: Would you like me to do that, then? Mr. Daschmans' -- the testimony that has been -- that you have filed in this proceeding dated January 4th -- let's see, entitled Transmission System Reliability, Interconnection of the Elk Hills Power Project.

Do you adopt that as your true and sworn testimony in this proceeding?

MR. DASCHMANS: I do.

MS. LUCKHARDT: Okay. Then I guess the

Applicant, on behalf of the California ISO, would move that this -- the testimony of Mr. Daschmans be entered into the record.

HEARING OFFICER WILLIAMS: Is there any objection to the testimony?

MS. WILLIS: None.

HEARING OFFICER WILLIAMS: Okay. Then Mr. Daschmans' testimony will be marked as Exhibit 24. And thank you very much, Mr. Daschmans, for your testimony.

(Thereupon, Exhibit 24 was marked for identification and was received into evidence.)

HEARING OFFICER WILLIAMS: I believe that concludes the presentation on Transmission System Engineering.

MS. LUCKHARDT: Yes, it does.

HEARING OFFICER WILLIAMS: Okay. Applicant, are you prepared to proceed?

MS. LUCKHARDT: We're prepared to move forward with Transmission Line Safety and Nuisance. And the Applicant's witnesses are the same witnesses we had for Transmission System Engineering, Mr. William Engelbrecht and Mr. Joe Rowley. They have both previously been identified

and been sworn, and have previously filed their qualifications for the record.

TESTIMONY OF

WILLIAM R. ENGELBRECHT AND JOSEPH H. ROWLEY

called as witnesses on behalf of the Applicant, having previously been duly sworn, were examined and testified further as follows:

DIRECT EXAMINATION

MS. LUCKHARDT: Mr. Engelbrecht, would you please identify the exhibits you are sponsoring in the area of Transmission Line Safety and Nuisance?

MR. ENGELBRECHT: Yes. I'm sponsoring, along with Mr. Rowley, portions of Exhibit 1, specifically Section 4.2, Transmission Line Safety and Nuisance, and Section 6.4.3, on the LORS.

MS. LUCKHARDT: And do you have any corrections to make to your testimony today?

MR. ENGELBRECHT: I do not.

MS. LUCKHARDT: And do you accept the conditions of certification, Transmission Line Safety and Nuisance 1 through 6, included in the Final Staff Assessment?

MR. ENGELBRECHT: Yes, I do.

MS. LUCKHARDT: And do you adopt the

portions of your testimony that have previously been filed as your true and sworn testimony in this proceeding?

MR. ENGELBRECHT: Yes, I do.

MS. LUCKHARDT: Thank you.

Mr. Rowley, could you please identify the exhibits you're sponsoring in this topic area?

MR. ROWLEY: Along with Mr. Engelbrecht, I'm co-sponsoring the same exhibits that he identified.

MS. LUCKHARDT: And do you have any corrections to make to that testimony today?

MR. ROWLEY: No.

MS. LUCKHARDT: And do you adopt that testimony as your true and sworn testimony in this proceeding?

MR. ROWLEY: Yes.

MS. LUCKHARDT: And could you please summarize the Applicant's testimony on Transmission Line Safety and Nuisance?

MR. ROWLEY: Sure. We commissioned studies of audible noise, radio and transmission -- pardon me, radio and television interference, and electromagnetic field strength. These studies found no adverse effects resulting from the

project.

The project will be designed in accordance with General Order 95 and other applicable laws, ordinances, regulations and standards to address nuisance and safety issues related to static electricity and grounding.

And we are in agreement with the proposed conditions of certification, as Mr. Engelbrecht stated.

That concludes my summary.

MS. LUCKHARDT: At this time we would like to move the Applicant's exhibits in the area of Transmission Line Safety and Nuisance into evidence, at this point.

HEARING OFFICER WILLIAMS: Any objections?

MS. WILLIS: None.

MS. REYNOLDS: No.

HEARING OFFICER WILLIAMS: So moved.

(Thereupon, the Transmission Line Safety and Nuisance portions of Exhibit 1 were received into evidence.)

MS. LUCKHARDT: The witnesses are available for cross.

HEARING OFFICER WILLIAMS: Cross?

MS. WILLIS: Staff has no questions.

MS. REYNOLDS: No questions.

HEARING OFFICER WILLIAMS: Okay.

Staff, you may proceed.

MS. WILLIS: At this time the staff would like to call Dr. Obed Odoemelam.

HEARING OFFICER WILLIAMS: The witness has been previously sworn.

DR. ODOEMELAM: No, not for this.

HEARING OFFICER WILLIAMS: Okay. Would you swear the witness, please?

(Thereupon, Obed Odoemelam was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

TESTIMONY OF

OBED ODOEMELAM

called as a witness on behalf of the Commission staff, having first been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. WILLIS:

Q Could you please state your name for the record?

A Obed Odoemelam.

Q And did you prepare the section of the

Final Staff Assessment entitled Transmission Line Safety and Nuisance?

A Yes, I did.

Q And that FSA has been identified previously as Exhibit 19.

Did you include in that Exhibit 19 a statement of your qualifications?

A Yes, I did.

Q Do you have any changes or corrections to your testimony today?

A No, I don't.

Q Do the opinions contained in your testimony represent your best professional judgment?

A Yes, they do.

Q And could you please provide a brief summary of your testimony?

A I have assessed the project's proposed transmission line for --

COMMISSIONER MOORE: You're going to have to speak up a little bit. That's -- that's recording. So you're going to have to speak up without amplification.

THE WITNESS: Okay. I have assessed the project's proposed transmission line for

compliance with standards, laws and regulations that deal with the design, location, and operation. And these laws or standards are designed to address issues related to physical impacts of the line, as detailed in my testimony.

And I find the design and operation and routing to be in keeping with these regulations, and I have recommended specific conditions of certification to ensure that the line is actually built and operated according to these design assumptions.

BY MS. WILLIS:

Q Does that conclude your testimony?

A Yes, it does.

MS. WILLIS: At this time staff would like to move the section of the FSA entitled Transmission Line Safety and Nuisance into the record as part of Exhibit 19.

HEARING OFFICER WILLIAMS: Are there any objections?

MS. LUCKHARDT: No objections.

MS. REYNOLDS: No.

HEARING OFFICER WILLIAMS: So moved.

(Thereupon, the Transmission Line Safety and Nuisance portion of Exhibit 19 was

received into evidence.)

MS. WILLIS: And this witness is available for cross examination.

MS. LUCKHARDT: No questions.

MS. REYNOLDS: No questions.

HEARING OFFICER WILLIAMS: Thank you. Thank you for your testimony.

I believe that concludes the presentation on Transmission Line Safety and Nuisance. The record will be closed on Transmission Line Safety and Nuisance.

And we're prepared to move to the next topic. Applicant, are you prepared to proceed?

MS. LUCKHARDT: Yes, we are. At this point, did you also close the record on Transmission System Engineering? That may have been marked.

HEARING OFFICER WILLIAMS: The record will be closed on Transmission System Engineering.

MS. LUCKHARDT: Public Health will be handled by Taylor Miller.

HEARING OFFICER WILLIAMS: Thank you.

MS. LUCKHARDT: And I'll be back for Hazardous Materials.

HEARING OFFICER WILLIAMS: It's probably

a good time for a five minute break. We'll go off the record for five to ten minutes.

(Thereupon, a recess was taken.)

COMMISSIONER MOORE: For people up here without their coats, I might just say that that's okay with us. And to add that as far as we're concerned, nobody's professional stature is enhanced by wearing a tie. I notice that Dr. Fox fails to wear a tie, just because --

(Laughter.)

COMMISSIONER MOORE: A fact that is not lost. So with the -- especially if they're going to put us in this kind of hearing room, formality is -- accuracy weighs in ahead of formality. Brevity, of course, is ahead of that --

(Laughter.)

COMMISSIONER MOORE: Major.

HEARING OFFICER WILLIAMS: Yes. Thank you. Okay. The Applicant may proceed.

MR. MILLER: Thank you. We would like to proceed with Public Health. As a panel, we have three witnesses, Mr. Dwight Mudry, Mr. Dennis Champion, and Mr. Steven Radis. Since we have two mics, and three -- four people, what we'll do is we'll begin with Dwight Mudry, and then he will

take a seat over here away from the mic. In case he needs to speak up we will just have to pass the mic later. And then we'll proceed with Mr. Champion, and Mr. Radis.

TESTIMONY OF

DWIGHT R. MUDRY

called as a witness on behalf of the Applicant, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

BY MR. MILLER:

Q So beginning with Mr. Mudry -- this is Dwight R. Mudry -- would you please state your name for the record, now that I've already done so.

A Yes. My name is Dwight Mudry.

Q And your occupation?

A I'm a consulting scientist with Foster Wheeler Environmental.

Q And you have previously submitted your professional experience as part of your pre-filed testimony, so I won't ask you to repeat that.

Could you please explain the purpose of your testimony?

A Yes. My testimony describes the

potential effects of Elk Hills Power Project on public health.

Q In addition to your testimony are you sponsoring any portions of the Application for Certification for the Elk Hills Power Project?

A Yes. Along with Dennis Champion and Steve Radis, I'm sponsoring AFC Section 5.15, Public Health, and Section 6.5.15, which is Public Health LORS.

Q Okay. Are you sponsoring any portions of other exhibits?

A No.

Q Do you have any corrections to make to the portions of the exhibits that you are sponsoring?

A No, I don't.

Q Are you sponsoring further testimony in this proceeding?

A Yes. I'm sponsoring the testimony included as Attachment A to my previously filed testimony.

Q And that would be entitled Attachment A, Testimony of Dwight R. Mudry regarding Public Health in support of the Application for Certification for the Elk Hills Power Project?

A Yes, it is.

Q And do you adopt the testimony included in those portions of the exhibits identified previously as your true and sworn testimony in this proceeding?

A Yes, I do.

Q Could you please summarize your testimony?

A Yes. The Elk Hills Power Project will be fueled with clean burning natural gas to minimize potentially toxic air emissions. In the health risk assessment that was done, the maximum incremental cancer risk from project emissions was estimated to be 0.12 in one million, which is well below the significance level of one in one million.

For sensitive receptors, the maximum chronic total hazard index, THI, was estimated to be 0.014, and the maximum acute THI was estimated to be 0.043, both well below the significance level of 1.0.

Based on this evaluation, using conservative assumptions, the Elk Hills Power Project emissions are expected to pose no significant cancer or non-cancer health effects.

Q Thank you. Does that conclude your testimony?

A Yes, it does.

MR. MILLER: Very good.

TESTIMONY OF

DENNIS CHAMPION

called as a witness on behalf of the Applicant, having been previously duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

BY MR. MILLER:

Q Mr. Champion, could you state your name and occupation for the record, please?

A Dennis Champion. I'm the Project Permitting Manager for Elk Hills Power.

Q Could you please briefly describe your educational background and occupational experience as it relates to this testimony that you're about to give?

A I have a degree in chemical engineering from Cal Poly Pomona, here in California. I'm also registered as a chemical engineer in the State of California. I have 14 years of experience as a air quality permitting manager, and also experience in the overall management of

environmental programs.

Q Are you the Project Permitting Manager for the Elk Hills Power Project?

A Yes, I am.

Q Please explain the purpose of your testimony.

A I'm here to support the Public Health section of the AFC document, that is Exhibit 1.

Q And you are sponsoring portions of the AFC?

A Yes, I am. That would be AFC Section 5.15, Public Health, and Section 6.5.15, Public Health LORS.

Q Are you sponsoring portions of any other exhibits?

A No.

Q Do you have any corrections to make to the portions of the exhibits that you are sponsoring?

A No, I do not.

Q I would like to ask you a few questions, if I might, regarding the Public Health section of the staff's Final Staff Assessment, and the staff's Preliminary Staff Assessment.

Did you review those documents?

A Yes, I did.

Q Do you recall staff's reference to soot filters as an adequate method to control construction related air emissions?

A Yes.

Q And do you also recall a discussion of this topic in the staff's Preliminary Staff Assessment on Air Quality?

A Yes, I do.

Q Could you state, please, your position regarding the use of a post-combustion soot filter control -- to control construction emissions?

A At the request of CEC staff, the EHP has conducted some investigation into control techniques for -- excuse me, specifically for construction equipment. Our preliminary investigation has revealed that this may be a suitable type of control technique for various types of construction equipment, be it not all construction equipment. However, we're continuing this investigation as we speak.

Q So would it be accurate to say that the Elk Hills Power Project is willing to employ soot filters in its construction program for the project?

A Yes, I think that would be accurate, with one minor caveat. What we would prefer is with, of course, the CPM approval, the ability to remove the soot filters in the event that they are unsuitable for the use that we place them in.

Q And why would you want the CPM to have such flexibility?

A If the -- during the project the CPM would be required to have that type of flexibility to -- since the equipment is not suitable for all types of construction equipment, he needs the ability to allow us to remove the equipment if there's a potential for damage to the equipment.

Q All right. In other words, if you run into operational problems you just want to have some kind of a safety valve to address that.

A That's right. And -- correct.

Q Okay. Let's switch now, if we could, to the matter of combustion turbine emissions. Did you review the Public Health testimony submitted by Dr. Fox on behalf of CURE?

A Yes, I did.

Q And do you recall that Dr. Fox raised a question in her testimony, I believe it was on page 9, concerning whether oxidation catalysts

will be used on the Elk Hills Power Project combustion turbines?

A Yes, I do.

Q Could you comment on that matter, please?

A As we discussed in the AFC, and the DOC, the project will utilize SCR with ammonia injection for the control NOx, and an oxidation catalyst for the control carbon monoxide and volatile organic compounds.

Q Therefore, the oxidation catalyst is simply part of the project as proposed for licensing before the Energy Commission?

A That's correct.

Q Now, a couple of other questions about oxidation catalysts. What compounds are they used to control?

A As I stated earlier, typically they're for carbon monoxide. Being an oxidizing catalyst, they also control volatile organic compounds.

Q And is the catalyst's operation temperature dependent?

A Yes, it is.

Q And how quickly does the oxidation catalyst respond to exhaust temperatures?

A The actual oxidation catalyst is relatively small, and once the turbine is fired the oxidation catalyst comes to a temperature relatively quickly and is effective to a certain degree almost immediately upon firing.

Q Thank you. Does that conclude your testimony?

A Yes, it does.

MR. MILLER: All right. We would now like to present Mr. Radis. So I'll ask you, please to state for the record -- oh, excuse me. Thank you. We do need to swear Mr. Radis.

(Thereupon, Steven R. Radis was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

MR. MILLER: As a matter of fact, we need to swear Mr. Mudry and Mr. -- did we do that?

HEARING OFFICER WILLIAMS: They were previously sworn.

MR. MILLER: Somehow that passed me.

All right, let's start with Mr. Radis, then.

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TESTIMONY OF

STEVEN R. RADIS

called as a witness on behalf of the Applicant, having first been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MILLER:

Q Could you state your name and occupation for the record?

A My name is Steve Radis, and I'm a Principal and do environmental risk consulting for Arthur D. Little, Incorporated.

Q Thank you. And could you briefly describe your educational background and previous experience?

A I have --

Q Relating to this testimony.

A I have a Bachelor's and Master's degree in Climatology from California State University of Northridge, and about 20 years of experience preparing risk assessments, meteorological modeling, and risk analysis.

Q Thank you. Could you briefly describe your experience more specifically relating to health risk assessments?

A I've prepared probably more than a hundred health risk assessments for a wide variety of facilities, including power plants, oil and gas facilities, and remediation projects.

Q And could you detail just briefly your power plant experience?

A I've probably prepared more than 20 health risk assessments for power plants, including most of the power plants that were formerly in the Southern California Edison system.

Q And were some of these gas turbine combustion power plants?

A Yes, they were.

Q And have you also reviewed risk assessment portions of any recent AFCs before the California Energy Commission?

A Yes, I've reviewed the risk assessments for La Paloma and the Sunrise Project.

Q Are you aware of any gas-fired power plant for which the health risk assessment concluded that there was a significant risk?

A None that I'm aware of.

Q Thank you. Are you sponsoring, in addition to your testimony, any portions of the Application for Certification for the Elk Hills

Power Project?

A Yes. I'm sponsoring the same sections as Dennis Champion and Dwight Mudry.

Q And are you sponsoring any portions of other exhibits?

A No.

Q Now I'd like to reference again the CURE testimony filed with regard to Public Health by Dr. Fox, and touch upon a few matters that were raised --

COMMISSIONER MOORE: Which part? Do you have citations from that testimony? Do you --

MR. MILLER: Yes, I will. This is the testimony that was filed January 12th in this proceeding.

I would like to preface this line of questioning by saying that I do not intend to delve into every aspect of acrolein or other issues raised in the Sunrise proceeding, just to allay your fears in that regard. I would like to touch, however, for the purpose of our record, on some of the key points. So with that, I'll begin.

BY MR. MILLER:

Q Mr. Radis, are risk assessments typically conducted for construction emissions?

A Not usually.

Q And could you explain why that's the case?

A Typically, construction projects are very short in duration. Emissions are relatively low in magnitude, and it's the general feeling on most projects that the health risk would be insignificant.

Q And are there any additional mitigation measures being employed in this particular project which we're considering now, which would further reduce the significance of construction emissions?

A As mentioned by Dennis Champion, the project is proposing to use soot filters on the construction equipment to further reduce toxic emissions.

Q Have any of the health risk assessments you've reviewed for gas turbine power plants that you're familiar with analyzed the effects of construction?

A Could you repeat that?

Q Have any of the health risk assessments for gas turbine power projects that you have reviewed analyzed the effects of construction?

A Aside from -- no, actually they haven't.

Q Thank you.

A Now that --

Q When preparing the air toxic emission estimates for the Elk Hills Power Project, how did you estimate peak hourly acrolein emissions?

A We used the ARB CADEF database emission factors for gas turbines, and for the peak hour emissions we took the maximum emission factor in the database instead of using the average emission factor.

Q Would the use of the peak emission factor for acrolein overestimate the potential acute health risks?

A For this particular facility it probably would, given that the Applicant will be using oxidizing catalysts on the turbines. The emission factor probably would be more representative of the lower bound emission factor in the database.

Q And what difference would that be -- quantitatively would that make?

A Quantitatively, the difference between the two emission factors is about a factor of 30. The maximum is about 30 times higher than the minimum emission factors.

Q Okay. And how would the CURE testimony

related to the potential problems with the acrolein analytical methods inherent in the Air Resources Board's database affect the selection of an appropriate emission factor?

A The CURE testimony basically states that the emission factor probably underestimates emissions by a factor of 10. We reviewed the article, and the factor of 10 is based on an extrapolation of a non-linear reaction rate of the acrolein derivative. The particular article only shows the reaction rate out to about 72 hours, which would be about a factor of three difference in the estimated versus actual acrolein emissions.

We were not able to extrapolate beyond that to quantifiably determine if a factor of 10 would be appropriate.

Q So in other words, that would -- that factor of 10 could easily be too high?

A It could be too high. We don't know if that reaction reaches a steady state or if it continues to decline.

Q And, in fact, would it be speculative to say that the factor -- the multiplication factor should be 10?

A I think probably a factor of 10 would be

speculative, yes.

Q How would the potential underestimation of acrolein emissions affect the acute health risk estimated for the Elk Hills Power Project?

A Well, it would -- if we were to employ a factor of 10 increase, obviously the acute hazard index for acrolein would also increase by that amount. But given the estimated acute risk that we've already identified, as well as the effect of the oxidizing catalyst on combustion turbines, we feel that the acute hazard index would still be well below the significance factor of one.

Q And would that -- would there also be a consideration in that regard relating to the fact that the maximum emission factor value in the Air Resources Board's CATEF database was employed in the health risk assessment as opposed to the minimum, which you stated a moment ago was three times less?

A Right. When we do the analysis we do not take account of any emission control technology for VOCs, and just conservatively assume that the maximum rate would be -- at least a conservative analysis for the peak one hour concentration.

Q Do you recall that Dr. Fox's public testimony also raised questions about the impact of start-up emissions.

A Yes.

Q Could you comment on that issue, please?

A Well, again, based on testimony earlier, I think it was by Dennis Champion, the oxidizing catalyst would probably come up to full temperature within about five minutes. Therefore, on an hourly average basis, which is also the basis for acute hazard index, the increase in emissions would be only be on the order of about ten percent over normal operating conditions.

Q Thank you. Is there any effect regarding shut-down on calculation of the hazard?

A No. The catalyst is operating at full efficiency when the unit shuts down.

Q Do you believe that all significant sources of emissions were included in the risk assessment set forth in the AFC and referenced in the Final Staff Assessment?

A I believe so. We did not include cooling tower emissions because the facility would be using potable water, and we did review what those emissions would be and they're pretty

insignificant.

Q Dr. Fox also raised questions of background air quality in the CURE public health testimony. Could you comment on that issue, please?

A Right. The CAPCOA guidelines specify that if the hazard index is .5 or greater, that background air quality values should be used. Since our acute hazard index, as well as chronic hazard index, was well below .5, there was no need to look at background air quality values.

Q Did the health risk assessment presented in the AFC and referred to in the Final Staff Assessment utilize reference exposure limits, or RELs, or permissible exposure limits, PELs?

A When we did the risk assessment we treated all individuals outside the 12 acre facility as the public, and used the worst case exposure assumptions of 70 years of continuous exposure. And we also applied the reference exposure levels to those individuals, even though they would be more representative of healthy workers and covered by other regulations.

Under the CAPCOA guidelines we could've applied a factor of .14 to account for the

decreased exposure from seven years, and that's based on an eight hour workday, 240 days a year, for a long career of 46 years.

Q Okay, thank you. Do you -- finally, do you have any corrections to make to your pre-filed testimony?

A Yes. Paragraphs B and C in the testimony, I think I referred to the number of sources and compounds that have been included in the health risk assessment. Those are related to the cooling tower emissions. We actually did model cooling tower emissions and deposition for each of these toxic materials as part of the Biological Resources section, and I had assumed that those had been included in the health risk assessment. When I reviewed that this week, I realized that they were not included in the risk assessment.

Q All right. Thank you. Excuse me, I have to back up for just a second.

Are you sponsoring further testimony in this proceeding?

A Yes, Attachment A of my testimony.

Q All right. And that's the document entitled Attachment A, Testimony of Steven R.

Radis regarding Public Health, in support of the Application for Certification for the Elk Hills Power Project; correct?

A Yes.

Q And do you adopt the testimony included in Attachment A and those portions of the exhibits identified previously in your testimony as your true and sworn testimony in this proceeding?

A Yes.

Q And does this conclude your testimony?

A Yes.

MR. MILLER: Thank you. The witnesses are available for cross examination.

HEARING OFFICER WILLIAMS: As a housekeeping matter -- well, first of all, staff, will you have any cross examination?

MS. WILLIS: We won't have any cross examination questions.

HEARING OFFICER WILLIAMS: CURE, we were thinking about taking a lunch break. Would that be acceptable before your cross examination?

Okay.

MR. MILLER: One other administrative matter. We do need to move our exhibits into evidence on Public Health.

HEARING OFFICER WILLIAMS: Okay. So what we'll do is when you complete your presentation, before any cross examination, we'll take our lunch break.

MR. MILLER: We have completed our presentation.

HEARING OFFICER WILLIAMS: Okay. Would you like to offer those exhibits?

MR. MILLER: Yes. I would like to offer the exhibits that were referred to in the testimony of Mr. Mudry, Mr. Champion, and Mr. Radis into evidence.

HEARING OFFICER WILLIAMS: What about the correction to the testimony? Do you have a -- a written --

MR. MILLER: We did not prepare a written amendment to that, but we're going to rely on the record.

MS. REYNOLDS: Yeah. Can you actually specify the page number for that? I didn't --

MR. MILLER: That was page 4, paragraphs B and C.

MS. REYNOLDS: Okay. Thanks.

HEARING OFFICER WILLIAMS: Could I ask you just at some point to prepare a written change

so that we can introduce that, so the record will be clear?

MR. MILLER: All right.

HEARING OFFICER WILLIAMS: Thank you. With that, I think it's -- are there any objections to the admission of the Applicant's documents?

MS. WILLIS: None.

HEARING OFFICER WILLIAMS: Seeing none, those will be admitted.

MR. MILLER: Thank you.

(Thereupon, the Public Health section of Exhibit 1 was received into evidence.)

HEARING OFFICER WILLIAMS: And at this point we'll take a lunch break until 1:00 o'clock.

(Thereupon, the luncheon recess was taken.)

AFTERNOON SESSION

COMMISSIONER MOORE: I think that you are up for cross examination.

MS. REYNOLDS: Okay. I have a couple of questions for Mr. Champion about the soot filter issue.

TESTIMONY OF

DENNIS CHAMPION AND STEVEN R. RADIS

called as witnesses on behalf of the Applicant, having previously been duly sworn, were examined and testified further as follows:

CROSS EXAMINATION

MS. REYNOLDS: You stated that the Applicant was amenable to using the soot filters, provided that the Compliance Project Manager had discretion to not use them when they were unsuitable for use. And I wanted to kind of explore the bounds of what was unsuitable for use.

One thing I heard you mention was if they would damage the equipment. Is this the only factor that would cause the soot filters to be unsuitable for use, or are there others?

MR. CHAMPION: I believe that the primary consideration, of course, is the operational capability of the equipment. If we

get into a situation where the equipment is not performing satisfactorily, we enter into a situation where a number of other variables would have to be considered.

What I'd like to do is have the operational flexibility to install these in the correct situation, as per manufacturer's requirements, with the approval of CPM.

MS. REYNOLDS: The manufacturer of the construction equipment, or the soot filter?

MR. CHAMPION: I'd like to consider input from both manufacturers.

MS. REYNOLDS: When -- is this something that can be resolved before the project is certified, or do you just want this flexibility?

MR. CHAMPION: Well, I believe if -- if it's a condition of certification, that would require that we have this resolved prior to construction activities.

MS. REYNOLDS: I have some more questions for Mr. Radis. I believe these are in your area. Actually, I think both of you discussed this, so Mr. Champion, I think you specifically stated this. But if -- you can choose whoever wants to answer this.

You had stated that the CO catalyst becomes effective almost immediately, and I believe Mr. Radis said within five minutes. Do you agree with that time estimate?

MR. CHAMPION: I apologize for not being more precise. I think it's fairly well known that temperature profile of the exhaust of the GE machine becomes a temperature within approximately five minutes.

MS. REYNOLDS: Do you know the temperature at which the oxidation catalyst starts to become effective?

MR. CHAMPION: The -- the manufacturer specifies that the CO catalyst is effective at 600 degrees.

MS. REYNOLDS: Okay. Is that -- so it -- how long does it take to reach 600? Is that the five minutes?

MR. CHAMPION: The exhaust temperature is 600 degrees approximately five minutes after first fire.

MS. REYNOLDS: Okay.

Mr. Radis, do you agree with those statements?

MR. RADIS: Given that that's the

information I received from the Applicant, I would have to.

MS. REYNOLDS: Okay. Thank you.

Mr. Radis, in your testimony, in your written testimony, you stated that emissions from the emergency diesel engine were not included since the equipment would rarely be used and emissions would be insignificant, and all other associated equipment would likely be shut down. That was in Attachment A, page 4.

Have you seen the PDOC, the Preliminary Determination of Compliance, for the project?

MR. RADIS: No, I have not.

MS. REYNOLDS: Okay. So you're not aware that the PDOC allows the emergency diesel engine to operate 200 hours per year in addition to emergencies?

MR. RADIS: I was not aware of that.

MS. REYNOLDS: Would that change your opinion?

MR. RADIS: The permit may allow 200 hours per year. Of course, under a CEQA analysis we probably would want to consider looking at 200 hours per year, but I don't know at this point if they would operate anywhere near that condition.

My gut feeling is if you were to model it that it would probably still not contribute significantly to the overall health risk. That's really a ballpark feeling.

MS. REYNOLDS: So you haven't actually modeled that?

MR. RADIS: I have not modeled the generator.

MS. REYNOLDS: Do you -- can you explain what an oil vent is? Or Dennis?

MR. RADIS: Perhaps Mr. Champion could explain better than I can.

MR. CHAMPION: On the lube oil container vessel where the lube oil is stored, there is a vent for the container.

MS. REYNOLDS: Are there emissions associated with that vent? Does it emit anything?

MR. CHAMPION: It can emit whatever's contained in the tank.

MS. REYNOLDS: Which for this project would be?

MR. CHAMPION: Lube oil.

MS. REYNOLDS: Okay.

Mr. Radis, you state in your testimony that the project's cumulative impacts to public

health are expected to be insignificant because the La Paloma, Sunrise, and Midway Sunset Projects are approximately eight miles away. That's in Attachment A, page 3.

Did you consider in your cumulative impact analysis the emissions from existing operations at the Elk Hills oilfield, like oilfield operations, the natural gas plant, the cogen?

MR. RADIS: Based on CEQA requirements for cumulative analysis, the -- it's in one of your comments, as well, you consider past, present and reasonable foreseeable future projects. But that really applies to projects that are not reflected in the baseline. The existing operations at Elk Hills are basically baseline conditions under CEQA, and we would only look at new equipment that would be brought online within the oilfield as well as the surrounding projects.

MS. REYNOLDS: So in your Health Risk Assessment you didn't include those as -- emissions from those as background?

MR. RADIS: Given that our -- again, that our hazard indices were below 0.5, CAPCOA doesn't require that to be done, so we did not do

that.

MS. REYNOLDS: Related to acrolein, you stated that you evaluated the Freeman data and that that study supported a factor of three increase in the acrolein emission factor?

MR. RADIS: From what I could see on the graph, because the -- it's a very short duration. You would have to extrapolate beyond that, and I would be uncomfortable doing that.

MS. REYNOLDS: Can you -- there are actually two Freeman studies. Could you identify for us which one that you analyzed? There's one that's about CARB method 430 in 1993, and there's also a 1999 study with -- relates to sorbent tubes.

MR. RADIS: I'm not aware of what the date is of that study, although it was attached.

MR. MILLER: Is that attached to our testimony?

MR. RADIS: I believe it might be.

MS. REYNOLDS: Yeah, there's -- both of them were attached to Dr. Fox's Sunrise testimony, and one was in Exhibit 1 and one was in Exhibit 9.

MR. MILLER: Can you give us a moment?

MS. REYNOLDS: Sure, yeah.

(Inaudible asides.)

MR. RADIS: I'm still not sure which study it was, but it was the one that would only be about two or three pages long.

MS. REYNOLDS: Okay.

MR. RADIS: That had a graph showing the degradation of the acrolein derivative.

MS. REYNOLDS: Do you mind -- can we show you the two studies, could you --

MR. RADIS: Sure.

MS. REYNOLDS: -- tell from that whether --

MR. RADIS: I believe so. It was this one.

MS. REYNOLDS: And for the record, that is the Exhibit 9 to my Sunrise written testimony, so that was the 1999 study.

MR. RADIS: Okay.

MS. REYNOLDS: Are you aware of any projects, whether they be power plants or others, that have evaluated health risks associated with construction emissions?

MR. RADIS: That would be -- that would depend on, first, your definition of construction.

MS. REYNOLDS: Construction equipment?

MR. RADIS: Clearly, remediation projects evaluate health risks from construction equipment.

MS. REYNOLDS: Thank you.

That's all.

HEARING OFFICER WILLIAMS: Thank you.

Any redirect?

MR. MILLER: No. No, there won't be.

HEARING OFFICER WILLIAMS: Does that conclude your presentation?

MR. MILLER: I believe it does.

HEARING OFFICER WILLIAMS: Have you admitted those documents that you wish to admit?

MR. MILLER: We moved those earlier, I believe, and I thought that you had admitted them.

HEARING OFFICER WILLIAMS: So we'll move along to staff.

MS. WILLIS: The staff calls Obed Odoemelam and Rick Tyler. And I believe Mr. Tyler needs to be sworn in.

(Thereupon, Rick Tyler was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

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TESTIMONY OF

OBED ODOEMELAM AND RICK TYLER

called as witness on behalf of the Commission staff, having been first duly sworn, were examined and testified as follows:

DIRECT EXAMINATION

MS. WILLIS: Could you please state your name for the record?

DR. ODOEMELAM: Obed Odoemelam.

MS. WILLIS: And did you prepare the section of the Final Staff Assessment entitled Public Health?

DR. ODOEMELAM: Yes, I did, with -- in cooperation with Rick Tyler.

MS. WILLIS: Okay. And that section is part of Exhibit 19 that's been previously marked.

Do you have any changes or corrections to your testimony today?

DR. ODOEMELAM: No, I don't.

MS. WILLIS: And do the opinions contained in your testimony represent your best professional judgment?

DR. ODOEMELAM: Yes, they do.

MS. WILLIS: Could you provide, please, brief summary?

DR. ODOEMELAM: We have assessed the project that's proposed for the middle of an oilfield that is closed to the public, and also --

HEARING OFFICER WILLIAMS: I'm going to have to ask you to speak up, please.

DR. ODOEMELAM: Oh, yeah.

COMMISSIONER MOORE: That doesn't amplify. It only records.

DR. ODOEMELAM: Okay. And then we'll utilize natural gas, which is a relatively clean burning fuel, and assessed all the main sources of pollutants to assess the potential for effects with regard to non-criteria pollutants or toxic pollutants for which there are no established air quality standards.

And we have assessed all these sources, and narrowed the pollutants of concern to only two. These are the acrolein emissions associated with emissions from construction equipment, and also emissions from the gas turbine.

We do not believe that these pollutants will constitute a significant health impact, and certainly do not have any public health basis for requiring specific mitigation.

CURE does not agree with us in this, and

we believe that CURE's findings of significance as related to acute effects that are associated with combustion and then related directly to acrolein emissions are based on a flawed analysis, which is not in keeping with the requirements or the guidelines that they have relied on in the health risk assessment they conducted.

And so we believe that CURE's determinations are flawed, and we stand by our determination that the project as proposed will not pose a significant health hazard to the public, even the way it is configured on this location, and this operational configuration.

MS. WILLIS: At this time I'd like to ask you a few follow-up questions to clarify your testimony.

You did review CURE's testimony represented by Dr. Fox?

DR. ODOEMELAM: Yes, I did.

MS. WILLIS: Do you agree with Dr. Fox's findings and conclusions regarding construction impacts?

DR. ODOEMELAM: No, I don't.

MS. WILLIS: Could you please explain why?

DR. ODOEMELAM: Dr. Fox's findings are related to acrolein in two ways. First, they have used a speciation profile for vehicular emissions that are -- that are different from those of ARB, and which we are to rely on so that all such projects are assessed the same way, whether this, or any other such project. And also, as indicated earlier, Dr. Fox has found it appropriate to multiply the emission factor of acrolein by ten across board. If you combine this with the decreased acceptable exposure level for accurate impacts in the general public, you begin to find out why CURE continues to find impacts when we don't think that such impacts are justified by the information.

MS. WILLIS: Were you here earlier to hear the Applicant's testimony regarding soot filters and oxidation catalysts?

DR. ODOEMELAM: Yes, I was.

MS. WILLIS: And to the best of your knowledge, are these two issues addressed in the Air Quality testimony provided by the staff?

DR. ODOEMELAM: Yes, they are.

MS. WILLIS: And do you agree with Dr. Fox's findings regarding operational impacts?

DR. ODOEMELAM: No. We -- we believe, again, that Dr. Fox's findings are related, one, to the -- I guess their habit -- not habit, but we find that they always multiply all acrolein emissions by ten, which is not recommended by the -- by ARB. And also, they assume that even in this -- in this project in which the Applicant has proposed to use an oxidizing catalyst, not necessarily to control VOC emissions but to control carbon monoxide emissions, which are the largest emissions from a facility of this sort, and we believe that given the fact that such oxidizing catalysts have the benefit of reducing the emissions of volatile organic compounds, of which acrolein is a part, that any concern that CURE might have should be laid to rest.

MS. WILLIS: Thank you.

I'd like to ask Mr. Tyler a couple of questions at this time. Did you review Dr. Fox's testimony?

MR. TYLER: Yes, I did.

MS. WILLIS: Do you agree with Dr. Fox's assertion that Occidental employees should be treated as public receptors?

MR. TYLER: No, I don't. And I'd like

to express a real concern I have here is that I believe that all of the analysis that you've heard today reflects exposures that are estimated at the point of maximum impact. I'd like to make it very clear to everyone that the point of maximum impact is very near the -- the facility and within the Occidental petroleum oilfield.

It's my belief that by virtue of the fact that Occidental Chemical has incorporated this facility virtually in the center of their existing oilfield operations, that in fact they are obligated to protect their employees under existing Cal-OSHA regulations from any hazard that's introduced to them by this facility. As such, I believe the appropriate treatment of these individuals is -- they should be treated as workers.

Additionally, I would point out that they are exposed to many -- already exposed to many of the same hazards that -- that they would be exposed to as a result of this facility, such as ammonia.

My belief is that there's -- that there's not a reasonable justification for treating these individuals as public receptors.

And I'd like to point out that if you -- if you treat them as workers, which I believe is appropriate, that they in fact would be -- that the appropriate exposure criteria would be the permissible exposure limits. And in this case, that -- that permissible exposure limit is nearly -- is over two orders of magnitude higher than the REL.

The nearest point where I believe it's appropriate to employ the REL would be at the residence, which is nearly five miles away -- it's over five miles away from the proposed facility.

MS. WILLIS: Given your testimony, what difference in exposure would you expect to see at the residence as compared to the maximum -- point of maximum impact?

MR. TYLER: I didn't actually analyze it, but my experience would indicate to me that for that kind of distance I would expect one or two orders -- at least one or two orders of magnitude reduction in exposure level from the point of maximum impact.

MS. WILLIS: On page 7 of CURE's testimony, Dr. Fox raises an issue regarding a cumulative impact analysis, that staff did not

include other sources of emissions on the Elk Hills oil and gas field. Could you explain why these sources were not included in your analysis?

MR. TYLER: Generally, what -- what I think is appropriate to -- to realize here is that the Toxic Hot Spots program, which, by the way, is where the REL came from that everyone's been using to make these comparisons, is designed and is an existing regulatory program that has the basic intent of controlling unacceptable public exposures from hot spots, or from industrial complexes.

It -- it's my belief that that program is in the process of dealing with acrolein. They've obviously recognized it as a concern. I further would point out that there is no adequate existing information on background exposures to acrolein, and that if -- if ARB and OEHHA come to the conclusion that -- that they indeed need to investigate this further, that that would be established.

At this point in time, using any number for background would be in the realm of complete speculation. To do any kind of reasonable characterization of the existing background levels

of acrolein in this location would require a great deal of effort, and well beyond the scope of what CEQA requires staff to do. So we rely on the existing programs that are already in place to deal with these types of exposures.

I'd also like to point out that the REL for acrolein is based on mild eye irritation. It incorporates a safety factor of 60. So in other words, they looked at the point where eye irritation occurred, which is a very minimal end point of toxicity, obviously not a very serious outcome. And then they divided that number by 60 to establish the REL. So even in light of the kind of uncertainties that Dr. Fox has identified with regard to a factor or potentially ten increase in acrolein emissions, or any other of these factors, I don't believe there is any compelling need for us to second-guess the 2588 program. There's -- there's not likely to be any significant outcome by our allowing this program to work.

So we believe that from a cumulative standpoint, the 2588 program deals effectively with this -- with this concern.

MS. WILLIS: Does that conclude your

testimony?

MR. TYLER: Yes, it does.

MS. WILLIS: At this time staff would like to introduce the Public Health portion of the FSA into the record.

HEARING OFFICER WILLIAMS: Are there any objections?

MS. REYNOLDS: No.

HEARING OFFICER WILLIAMS: Any objections?

MR. MILLER: No. I'm sorry.

HEARING OFFICER WILLIAMS: So admitted.

(Thereupon, the Public Health section of Exhibit 19 was received into evidence.)

MS. WILLIS: And these witnesses are now available for cross examination.

MR. MILLER: I have just one question that I'd like to pose to -- I'll speak up a little louder, I'm sorry -- to, if I could say, Dr. Obed.

CROSS EXAMINATION

MR. MILLER: Could you please comment on the significance of the acute hazard index of one. In the event that for some reason when one applies one of these seemingly endless number of variables

such that a calculation can be made to produce a result over one, what would that -- would the significance of that be?

DR. ODOEMELAM: This question goes to the appropriate use of these guidelines. They are used in the light of scientific uncertainty to ensure that all sources are treated the same way, so that in the case when you have a hazard index of more than one, given the uncertainty, great uncertainty in the process for establishing exposure -- in the exposure assessment section of the analysis, and also establishing the acceptable risk levels, you assume that is so great, that just getting a hazard index of one, it's in a way a beginning for you to look at the analysis in a more refined way.

It is not intended as a trigger for action. The guidelines that Dr. Fox and all of us rely on, which we have developed in the 1980's, specifically recommends that the districts in cases of hazard index of one or more consult with OEHHA -- that is the Office of Health Hazard Assessment -- so that it is inappropriate to regard the hazard index of more than one as a trigger for action, the way CURE tends to do in

this analysis.

MR. MILLER: Thank you. I have no further questions.

HEARING OFFICER WILLIAMS: Questions?

MS. REYNOLDS: I'll start with Dr. Odoemelam.

CROSS EXAMINATION

MS. REYNOLDS: In your testimony in the Sunrise case, you stated that you felt constrained by the decisions of other regulatory agencies that have primary jurisdiction over certain issues, like CARB has --

MR. MILLER: Excuse me. I would object to the reference to the testimony in the Sunrise case. I think the foundation should be laid directly in this case.

MS. REYNOLDS: I am trying to see whether Mr. -- Dr. Odoemelam has a difference of opinion between Sunrise and this case. It's a manner of impeachment. I'm not trying to admit anything in the Sunrise transcript. I'm trying to see whether the doctor's opinion has changed.

COMMISSIONER MOORE: But in order to -- in order to do that, Counsel, you have to introduce a base document, or a base piece of

testimony that Obed already put on the record in another case.

MS. REYNOLDS: I -- okay. I'll rephrase my question, and then we may get to that point.

COMMISSIONER MOORE: It's -- it's probably going to be easier, because otherwise I think what the Applicant is saying is right, without bringing in that testimony, laying it on the ground here for us to see in this context, I think you're going to have a hard time. I think his objection is -- is correct.

So if you want to try and rephrase it.

MS. REYNOLDS: Yeah. Maybe if we go about this in a different order that will be -- it will become more evident.

COMMISSIONER MOORE: And maybe you can just ask a more direct question of Obed. I mean, I -- this might be easier than trying to -- to impeach has such a presidential tone to it.

(Laughter.)

MS. REYNOLDS: Okay.

Dr. Odoemelam, do you feel, does staff feel bound by the decisions of other regulatory agencies that have primary jurisdiction over certain issues, for example, CARB jurisdiction

over emission factors?

DR. ODOEMELAM: Well, what do you mean, decision as they relate to guidelines that allow for leeway?

MS. REYNOLDS: If CARB has emissions factors published in, say, for example, the CATEF database.

DR. ODOEMELAM: Uh-huh.

MS. REYNOLDS: Do you feel bound to use those factors unless and until CARB changes those factors?

DR. ODOEMELAM: Yes, we do.

MS. REYNOLDS: Okay. So until CARB changes the emission factor for acrolein, formally, in the CATEF database, you will continue to use the existing emission factor in the database; is that correct?

DR. ODOEMELAM: Yes.

MS. REYNOLDS: Is your significant standard, from a CEQA standpoint, is the significant standard you use for acute health hazard an index of one?

DR. ODOEMELAM: Yes, it is. Again, that will require modifying analysis if you are to depend on that for specific recommendations.

MS. REYNOLDS: In your testimony you discuss certain pollutants and sources of pollutants that the Applicant omitted from its analysis. That's in the FSA, page 26.

DR. ODOEMELAM: Yes.

MS. REYNOLDS: You then state, we established from our analysis that these pollutants are unlikely to be emitted at levels of health significance with respect to workers onsite or within the oilfields, or the general public.

Did staff estimate the emissions and model the health impacts of the diesel-fired IC engine, internal combustion engine?

DR. ODOEMELAM: No. When the project was filed initially, it was -- there was an indication that the -- that equipment would be fired about once a year, if I remember correctly.

MS. REYNOLDS: So you --

DR. ODOEMELAM: It has since been changed to a requirement that -- that it could be fired about once a month. And as indicated, about 200 hours in the course of a year.

MS. REYNOLDS: So you did not actually estimate those emissions yourself and include -- and model them for health impacts?

DR. ODOEMELAM: No, but we don't consider it's -- any emissions from there to be significant.

MS. REYNOLDS: Did staff estimate the emissions and model the health impacts of turbine start-up?

DR. ODOEMELAM: The air quality staff did.

MS. REYNOLDS: Okay. Did -- were those start-up emissions based on emission factors -- the same emission factors that were used during project baseload operations?

DR. ODOEMELAM: No --

MS. WILLIS: Well, just -- I want to object unless the witness has direct knowledge, because that -- that's reflected in our air quality testimony, that isn't --

MS. REYNOLDS: Well, the problem that I'm facing here is Dr. Odoemelam has made conclusions about the health impacts of the project. I'm trying to establish the foundation for his conclusions, and I don't have staff here, and when I -- I'm assuming when I get air quality staff up here they're not going to be qualified to testify about health impacts associated with air

emissions.

And so what I'm probing here is Dr. Odoemelam's foundation for his conclusion in his testimony.

COMMISSIONER MOORE: I'm not sure I understand. I mean, he -- he submitted written testimony to us, and he used a set of factors in there. There are factors that relate to air quality, there are factors that relate to air chemistry, as well. What -- when you use the word foundation for those, it seems to me that the metrics that he used, even to me, as a -- a non-chemist, were there.

What -- when you use the word foundation, what do you mean?

MS. REYNOLDS: I'm trying to -- he -- the statement he made in his testimony was, we established from our analysis that the pollutants that the -- the pollutants and the sources of pollutants that the Applicant omitted from its analysis were unlikely to be emitted at levels of health significance. That's what I'm trying to -- he made that conclusion that they were unlikely to be emitted --

COMMISSIONER MOORE: See, your question

is to Obed, what were the -- what were the criteria pollutants, or what were the constituent pollutants that you left out.

MS. REYNOLDS: Actually, the -- there are several things that were omitted. One was emissions from the internal combustion engine. I already asked a question about that, and he answered.

What I'm on now is turbine start-ups, and how the health impacts were assessed for turbine start-ups.

COMMISSIONER MOORE: Well, before we can get to health impacts, let's go back and say Obed, was there a list of things that were left out that was -- that was included in an appendix, or in your --

DR. ODOEMELAM: Not -- not emission from sources that we consider significant.

MS. REYNOLDS: Well, that's -- therein lies the question.

COMMISSIONER MOORE: Well, is there -- is there a list of what qualifies as not significant?

DR. ODOEMELAM: For instance, CURE points to potential impacts from cooling towers,

and points to sulfate emissions. Now, we looked at the concentration of the water quality that was provided, and the drift control efficiency of the -- that will be used for the drift eliminators that will be used at the -- for the cooling tower of .0001 percent. So the emissions from that facility would be unimportant.

We are concerned about the water treatment chemicals, and are particularly concerned with the fact the cooling towers would permit those additives, which we are --

MS. REYNOLDS: Can I just stop -- I'm sorry. I have not asked a question about cooling towers.

DR. ODOEMELAM: Okay.

MS. REYNOLDS: What I'm -- I have --

DR. ODOEMELAM: I was giving that as an example of --

MS. REYNOLDS: Okay. Okay. But what I'm trying to -- I would like the opportunity to cross Dr. Odoemelam on particular issues with respect to his health analysis, and I hope that that's my --

COMMISSIONER MOORE: Well, that -- that's perfectly within the realm of your

questioning. I'm simply trying to understand your question.

MS. REYNOLDS: Okay, that's fine.

COMMISSIONER MOORE: And so I'm trying to -- I'm not trying to steer you away from being able to do the questions. It's just I can't get the question clearly, and I'm sensing, unless I'm wrong, that Obed is not, either. So I'm just trying to intermediate here so we get a question that everybody can understand on the table, so.

MS. REYNOLDS: Okay. I appreciate that.

COMMISSIONER MOORE: Try -- try again.

MS. REYNOLDS: Okay. As far as modeling or assessing the health impacts associated with turbine start-up emissions --

DR. ODOEMELAM: Okay.

MS. REYNOLDS: -- do you know whether the emission factors used for turbine start-up were the same or different than emission factors during normal baseload operations, non-start-up conditions.

DR. ODOEMELAM: Now, you want to know if the emission factors were the same for start-ups, as opposed to normal baseload operations?

MS. REYNOLDS: Yes.

DR. ODOEMELAM: They're not the same, because of the fact that it takes a while for the post-combustion controls to kick in. But the place where CURE is mistaken is in assuming in the analysis that for this project configuration and where the steam is generated directly, that that warm-up period will last up to two hours. Our air quality staff has determined that it will be at most 20 minutes, and the Applicant has indicated that those controls would kick in almost immediately.

MS. REYNOLDS: But my question to you was were -- in the health impacts analysis that you performed, was the start-up emission factor the same or different than the baseload conditions start-up emission factor?

DR. ODOEMELAM: Well, they were factored differently.

MS. REYNOLDS: Okay.

DR. ODOEMELAM: But one important fact in determining whether or not we think the exposures would be -- would be significant is the length, length of time.

MS. REYNOLDS: I understand that. That's a different issue.

DR. ODOEMELAM: Okay.

MS. REYNOLDS: That's not my question.

DR. ODOEMELAM: Okay, but that's why we made the determination we did --

MS. REYNOLDS: Okay.

DR. ODOEMELAM: -- potential significance.

MS. REYNOLDS: Not my question.

DR. ODOEMELAM: Okay.

MS. REYNOLDS: Do diesel-fired internal combustion engines emit acrolein?

DR. ODOEMELAM: They do.

MS. REYNOLDS: Do they emit formaldehyde?

DR. ODOEMELAM: They do.

MS. REYNOLDS: Benzene?

DR. ODOEMELAM: They do.

MS. REYNOLDS: Polynuclear aromatic hydrocarbons?

DR. ODOEMELAM: They do.

MS. REYNOLDS: Diesel exhaust particulate matter?

DR. ODOEMELAM: They do.

MS. REYNOLDS: Are all of those compounds that we just covered pollutants for

which OEHHA has established an REL?

DR. ODOEMELAM: They are.

MS. REYNOLDS: Okay. Does staff's health risk analysis include the emissions of those pollutants on the IC engine?

DR. ODOEMELAM: Well, in general -- yes, they -- they include all those pollutants.

MS. REYNOLDS: From the internal combustion engine?

DR. ODOEMELAM: Yes. But we note that -- that --

MS. REYNOLDS: Where -- where --

DR. ODOEMELAM: We know that CURE's concerned with regard to those emissions from equipment of -- with regard to construction emissions.

MS. REYNOLDS: I -- we're not speaking of -- we're talking now about the emergency internal combustion engine.

DR. ODOEMELAM: Okay.

MS. REYNOLDS: Were -- was acrolein, formaldehyde, benzene, polynuclear aromatic hydrocarbons and diesel exhaust particulates from the emergency IC engine included in staff's health risk analysis for the project?

DR. ODOEMELAM: In general, yes. We considered the types of emissions that you would expect from combustion engines. And not one --

MS. REYNOLDS: Can you identify where that -- that analysis is? Is it contained in your testimony?

DR. ODOEMELAM: No, it's in our determination of significant sources of emissions from a facility such as this, for which there's a proposal to use an oxidizing catalyst.

MS. REYNOLDS: So for this particular project, you did evaluate the toxic emissions from the IC engine and include them in your health risk assessment?

DR. ODOEMELAM: Yes, we -- well, we did not include the analysis. We considered them, given, again, the length of time, the number of hours that are specified when they will be operated, and also the types of pollutants associated with -- with the operation of such equipment.

MS. REYNOLDS: Did you quantify them and model --

DR. ODOEMELAM: No.

MS. REYNOLDS: Thank you.

Did staff model the project's toxic emissions during start-up to see if they would cause or contribute to a significant health impact?

DR. ODOEMELAM: It was modeled by our air quality staff.

MS. REYNOLDS: For toxics, or criteria pollutants?

DR. ODOEMELAM: No, for criteria pollutants, not air toxics.

MS. REYNOLDS: Okay. Did staff calculate an acute health hazard index during start-up conditions?

DR. ODOEMELAM: No, we did not.

MS. REYNOLDS: Okay. You --

DR. ODOEMELAM: But CURE did.

MS. REYNOLDS: Pardon?

DR. ODOEMELAM: You did.

MS. REYNOLDS: Yes, we're aware of that.

DR. ODOEMELAM: And you made mistakes.

MS. REYNOLDS: Okay. We'll get to that later.

You state in your testimony that turbine start-ups are expected to last approximately two hours and may occur 120 times per year for each of

the two turbines, but you do not consider start-up emissions to pose a significant public health hazard for several reasons. That's in FSA page 28. One of the reasons you cited was the relatively short duration of the start-ups.

Is it true that acute health effects are measured over a one-hour period?

DR. ODOEMELAM: Yes.

MS. REYNOLDS: According to your testimony, start-ups would last two hours; is that correct?

DR. ODOEMELAM: That was before I realized that for this project, the steam is generated direct -- immediately, so there will be no need to heat up the water boiler that would generate steam. So that the -- the post-combustion controls for the NOx or for VOCs would kick in much faster than I had -- I had thought initially.

MS. REYNOLDS: But you didn't have that information when you prepared your testimony.

DR. ODOEMELAM: No, at the time, no.

MS. REYNOLDS: Have you reviewed the Preliminary Determination of Compliance for the project?

DR. ODOEMELAM: No, I have not. That will be done by air quality staff, in conjunction with the use of the appropriate BACT and the other controls.

MS. REYNOLDS: Another reason you cite for your conclusion that start-up emissions would not cause a significant health hazard was the fact that the project's air permit would require BACT, which would restrict VOC emissions to 5 ppm over a 24 hour period.

Are you aware that the PDOC does not contain any permit condition limiting hourly VOC emissions during start-up?

DR. ODOEMELAM: But it has an emission limit of 4 ppm, I think, at 15 percent of oxygen.

MS. REYNOLDS: Do you know whether that limit applies during start-ups?

DR. ODOEMELAM: No, it does not. No, I don't know if it does or not. But again, the issue of start-up emissions is -- is duration related.

MS. REYNOLDS: Okay. Are you aware that the -- well, I'll just tell you, since you haven't reviewed the PDOC.

DR. ODOEMELAM: Sure.

MS. REYNOLDS: The PDOC restricts the project's daily emissions of VOC on days when start-up occur to 96 pounds per day for each turbine. Do you -- can you tell us how that 96 pounds --

MR. MILLER: Excuse me. I'd like to impose a gentlemanly objection at this point. We seem to be going quite far along into the air quality area here, and I'm just wondering if this is fair game for the public health risk assessment topic.

MS. REYNOLDS: Can I respond to that?

HEARING OFFICER WILLIAMS: Please.

MS. REYNOLDS: Okay. I am dealing with health effects here. Unfortunately, health effects have an overlap with air quality impacts. Air quality staff seems to deal with criteria pollutants, whereas Dr. Odoemelam deals with toxic pollutants. So as Dr. Odoemelam has relied on air permit conditions to conclude certain things about the project's health impacts, I think that -- that that in his testimony has opened the door to these issues.

HEARING OFFICER WILLIAMS: Okay. As to the Applicant's objection, it's overruled.

MS. WILLIS: Well, I wanted to object just on the fact that he said he hadn't reviewed the PDOC, yet we're discussing it, and it's actually not entered as evidence and we don't have it.

HEARING OFFICER WILLIAMS: Well --

MS. REYNOLDS: Well, he's relied on it in his testimony, so that --

COMMISSIONER MOORE: Why don't we establish that that may be a gap. Obed, you relied on air quality data of some kind. Can you identify what air quality data you relied on in order to draw the conclusions that you did, especially those of areas that were not significant? What air quality --

DR. ODOEMELAM: There are two -- two issues. One of them, in our air quality section they specified a control percentage for NOx of 30 percent, I think it is. And then there is the issue of duration of that non-controlled emission.

Here, it has been established that the post-combustion controls will kick in much faster than one would have thought with regard to a project that does not generate steam the way this project does.

MS. REYNOLDS: I'm --

DR. ODOEMELAM: So there's an issue of absolute emissions and the duration of emissions.

MS. REYNOLDS: I understand that. I am trying to understand the basis for your testimony, which you have said you just learned that information. So I'm trying to understand the basis of your testimony as it is in the FSA. And in that testimony, you rely on the air permit limit of VOCs to five parts per million over a 24 hour --

DR. ODOEMELAM: And -- and also the fact that there's an oxidizing catalyst proposed for this facility.

MS. REYNOLDS: Correct. You had --

DR. ODOEMELAM: Okay.

MS. REYNOLDS: -- a few different reasons. I am trying to address the different ones.

The Preliminary Determination of Compliance limits the project's emissions of VOCs to 96 pounds per day for each turbine during start-ups. Can you explain how that emission limit relates to the five parts per million over 24 hours? Is it higher than the five parts per

million?

DR. ODOEMELAM: I guess I don't understand. What do you mean, can I explain.

MS. REYNOLDS: Would the 96 pounds per day emission limit in the PDOC, would those emissions be greater than five parts per million over 24 hours?

DR. ODOEMELAM: It might be. But again, in BACT analysis you have to remember that first of all there is an absolute requirement for limit for emissions. In this case, BACT for VOC, which is four parts per million. And then there's also the second case for an allowable emission limits per day, which is the number you have just quoted.

MS. REYNOLDS: Okay. I think --

DR. ODOEMELAM: Two issues. You're mixing them up.

MS. REYNOLDS: No. I understand that, but the PDOC -- perhaps it would be better if I just gave him an excerpt of the PDOC. Because the PDOC does not establish a BACT limit during start-up.

DR. ODOEMELAM: PDOC requirements are analyzed by our air quality staff. These are almost administrative analysis that specify BACT

requirements and --

COMMISSIONER MOORE: Well, okay. Obed, did you rely on the PDOC -- did you see the PDOC that Counsel is referring to?

DR. ODOEMELAM: No, I did not.

COMMISSIONER MOORE: So --

MS. REYNOLDS: He cited the -- he cited that the project's air quality permit will restrict VOC emissions to 5 ppm.

COMMISSIONER MOORE: I understand. And so in this case, absent him taking it and commenting on it, my guess is it's going to be easier for you to re-raise that PDOC issue in the air quality section.

MS. REYNOLDS: Yes, except for the fact that I won't have a public health witness when we get to air quality.

HEARING OFFICER WILLIAMS: Well, Counsel, is there something that you see -- you have a specific question. He's testified that he hasn't reviewed the PDOC. So probably the best way for you to get -- to get him to answer the question is to -- is to show him precisely what you are referring to, and ask him -- and ask the question that way.

MR. MILLER: May I interject just briefly? This line of questioning, I believe, started with page 28 of the FSA. Am I right about that?

MS. REYNOLDS: Correct.

MR. MILLER: And the reference to a 5 ppm limit for 24 hours is in that paragraph. That cites the AFC, not the PDOC. Of course, it was prepared before the PDOC was maybe out. I can't recall.

So I don't know that the PDOC is what was relied upon and is therefore relevant to this discussion.

HEARING OFFICER WILLIAMS: I understand, and the witness has already testified that he has not reviewed the PDOC. So I think the best way to proceed is for Counsel to show him the area of concern, and have him answer the question that way.

MR. MILLER: This does seem like a new exhibit coming in, kind of in -- at the day of the hearing, rather than --

HEARING OFFICER WILLIAMS: Well, we can -- we can mark it for identification now, if -- if you like.

MS. REYNOLDS: This isn't really a late exhibit. We are -- we just have a Preliminary Determination of Compliance here. We don't have a Final Determination of Compliance. So -- and it's not like you haven't seen the PDOC. It came directly to you. It's -- what I'm trying to do here, Dr. Odoemelam has on page 28 used as justification for finding that this project's start-up emissions will not cause significant health impacts, the fact that the project's turbines will be equipped to achieve the air district's BACT VOC limit of five parts per million for a 24 hour period.

COMMISSIONER MOORE: Okay, fine. And -- and what -- and your question is, is to him, as a public health expert, is that limit acceptable.

MS. REYNOLDS: No. The problem is the PDOC does not limit emissions during start-up to five parts per million. Start-up emissions are exempt from the normal BACT limits. Rather, they have a daily 96 pounds per day emission limit. And I can show him the PDOC for that.

DR. ODOEMELAM: My information is from the AFC. I usually don't look into the PDOC, because there are administrative angles to it.

MS. REYNOLDS: Okay.

DR. ODOEMELAM: The Applicant has indicated what emission limits would be placed on them. That's in the AFC, and that's what I relied upon.

MS. REYNOLDS: Okay. Thank you. That -- that --

HEARING OFFICER WILLIAMS: Does that clarify it for you, Counsel?

MS. REYNOLDS: Yes. Thank you.

With respect to background levels of toxic pollutants, you state in your testimony that staff does not expect these non-criteria pollutants to be encountered in the project area at significant concentrations. That's on page 27 of the FSA.

DR. ODOEMELAM: Yes.

MS. REYNOLDS: Did you make any measurements of background toxic pollutants in the Elk Hills Project area?

DR. ODOEMELAM: No, we did not, and we have not in the past.

MS. REYNOLDS: Okay. Did you attempt to estimate emissions of toxic pollutants from other sources in the project vicinity, such as the cogen

plant, the natural gas processing plant, or other oilfield operations?

DR. ODOEMELAM: No, but we looked at what CURE did, and CURE found only one out of 62 that were measured, which -- except for acrolein, which validates the fact that staff does not anticipate most of those pollutants to be encountered at significant background levels.

MS. REYNOLDS: Were CURE's measurements done at the Elk Hills oilfield?

DR. ODOEMELAM: No, but CURE has referenced those, those background measurements, as representative of oilfield operations. You have indicated that in your comments.

MS. REYNOLDS: My question to you is, has staff done any measurements --

DR. ODOEMELAM: No.

MS. REYNOLDS: Okay. That's all I have.

HEARING OFFICER WILLIAMS: Redirect?

MS. WILLIS: Can I have just one moment, please?

(Inaudible asides.)

HEARING OFFICER WILLIAMS: Ready, Counsel?

MS. WILLIS: Yes, thank you.

REDIRECT EXAMINATION

MS. WILLIS: Just two follow-up questions, Dr. Odoemelam.

Where is the dispersion modeling done?

DR. ODOEMELAM: It was done to establish the exposure among others to the individual that we exposed at maximum levels.

MS. WILLIS: Where -- where is that done? At what point?

DR. ODOEMELAM: It was done both within the -- the property boundary of the facility, and also around the -- in the area outside the property boundary.

MS. WILLIS: And do you know where the nearest residence is from the project site -- proposed site?

DR. ODOEMELAM: It's 5.1 miles away. Does not --

MS. WILLIS: Thank you. That's all I have.

COMMISSIONER MOORE: Applicant, recross?

MR. MILLER: No.

COMMISSIONER MOORE: CURE, recross?

MS. REYNOLDS: No.

COMMISSIONER MOORE: I think, CURE,

you're on. Your witness.

And Dr. Fox, have you been sworn in this case?

DR. FOX: Not in this case, no.

(Thereupon, Dr. Phyllis Fox was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

TESTIMONY OF

DR. PHYLLIS FOX

called as a witness herein on behalf of CURE, having first been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. REYNOLDS:

Q Dr. Fox, before you is a document entitled Testimony of J. Phyllis Fox, Ph.D., on behalf of the California Unions for Reliable Energy on Public Health Impacts of the Elk Hills Power Project, dated January 12th, 2000.

Is this your testimony in this proceeding?

A It is.

Q Was this testimony prepared by you or under your direction?

A It was.

Q Is this your true and sworn testimony?

A It is.

Q Can you briefly summarize the key points of your testimony for the Committee?

A Sure. There's three key points to my testimony. First, I -- because neither the Applicant nor staff did an analysis of the impacts of construction emissions, we performed a health risk assessment of the construction emissions. And in our work, we used the same modeling parameters and assumptions as the Applicant used in their air quality analysis for construction emissions. And that analysis showed that the acute impacts, the one-hour acute impacts, were significant, primarily due to the emission of our friend, acrolein. And in that analysis, we did not multiply the acrolein emission factor by ten. That is a significant impact, unless it's mitigated.

In this case, the Applicant has proposed to use oxidation catalysts, or oxidizing soot filters, rather, on the construction equipment. And in my opinion, that is sufficient to mitigate the significant impact. So as long as the use of

oxidizing soot filters is required in this case as a certification condition, I have no problems with the health impacts from construction emissions.

However, if when we get to the air quality phase the recommendation is recanted, then I would withdraw my conclusion that there are no significant impacts. As you will recall, that happened in the Sunrise case.

Q Can you discuss operational emissions?

A I'd like to make a few more comments on construction.

There was some discussion earlier about the fact that construction emissions are normally not considered in a health risk assessment. And that's not necessarily true. I have worked on a number of projects where the health impacts of construction emissions were considered. In fact, Mr. Radis prepared such an analysis in the case of two remediation projects on the central coast, one at Guadalupe and another at Avila. Agreed, some of that was from the remediation itself, but both of those projects involved the use of the same type of earth-moving equipment that you would have in this case. And in both of those projects, the impacts of exhausts from construction equipment

were evaluated.

So it's not that unusual to see health impact analyses on emissions from construction equipment, particularly given that CARB has now declared diesel exhaust as a toxic air contaminant. It's becoming quite common, actually.

Q Operational emissions?

A Operational emissions. We also did our own analysis of emissions from the turbines, and in our analysis we only looked at acrolein and formaldehyde because those are the two major drivers of acute health risks from the turbines. And in those analyses, we used the recent May 1999 OEHHA acute RELs. Both the Applicant and the staff used the outdated superseded RELs, and that makes quite a significant difference in the case of acrolein, because OEHHA lowered the acrolein REL by about a factor of ten.

So in our analyses, we used the most recent RELs, and we also multiplied the acrolein emission factor by ten. We found a significant acute health impact. And in that case, if an oxidation catalyst is used on this project, again, we have no problems, because the oxidation

catalyst removes 90 plus percent of both acrolein and formaldehyde. So to the extent that the Applicant has committed to the use of an oxidation catalyst, we also have no concerns there, but would ask that it be required as a certification condition.

The only reason I raise that is because the PDOC on this project, which contains the proposed draft permit conditions, is not clear on whether or not an oxidation catalyst will actually be used. The text in the PDOC talks about an oxidation catalyst, but the draft permit conditions themselves don't require one. And I raise that because if the final determination of compliance comes out without a recommendation for an oxidation catalyst, I would urge the Commission to impose a condition to require one.

Q Do you have any thing to respond to with regard to start-up emissions and the CO catalyst?

A Yeah. In the case of start-up emissions, the third analysis that we did was we analyzed the health impacts of start-up emissions. And it's important to separately look at start-up emissions because during start-up you're dealing with incomplete combustion. And in incomplete

combustion, you have a higher yield of aldehydes and other combustion byproducts than you have during normal operation, so you have to make an adjustment for that.

So we also separately analyzed start-up conditions. We adjusted for the increased yield of aldehyde by using the ratio of CO during normal operations to CO during start-up. And again, we multiplied the acrolein emission factor by ten. We found that those impacts were also significant.

There's been some discussion this morning about whether or not the oxidation catalyst actually works during start-up. The problem with catalytic based processes is their ability to remove pollutants depends on the temperature of the catalyst. Generally, the higher the temperature the more effective they are. And all of these catalytic processes have an optimum temperature at which they meet the guaranteed emission level.

In the case of an oxidation catalyst, it would normally be a 90 percent removal, and for your typical oxidation catalyst it would have to be at a temperature of 600 degrees to reach that 90 percent removal. The question is, during

start-up, what percentage of the time is the oxidation catalyst below that temperature as opposed to being above it.

In the case of this project, in the PDOC and in the draft permit conditions the assumption was made that the removal efficiency of the oxidation catalyst during the start-up time was zero. And in fact, the draft permit contains separate emission limits for start-up, as opposed to operations. And those separate emission limits were calculated assuming that the removal efficiency of the catalyst was zero throughout that start-up time. And that is, in my experience, pretty typical with these kinds of plants. You normally assume that the catalyst is not effective during the start-up time, and you calculate your emissions accordingly.

If the Applicant were willing to live with a start-up VOC and CO emission limit that was calculated based on the assumption that the catalyst was fully operational in five minutes, as they testified to, my concern about start-up health impacts would go away. But I feel that as long as there is a permit condition that states zero removal and emission limits that are based on

zero removal of that catalyst, that it would be prudent, as is typical in CEQA analysis, to calculate your health impacts and also your air quality impacts using that zero percent, because that's what their permit is based on, and that's what their potential to emit is based on.

You know, absent -- absent an agreement to lower the start-up emission limit in the permit, I feel that the Committee needs to impose additional mitigation to deal with what are really significant health impacts during start-up. And we're not dealing with an isolated event here. I think the Elk Hills PDOC allows 200 separate start-up attempts in a one-year period lasting one hour, and one start-up attempt lasting -- is it two or four hours -- a longer period of time.

Anyway, it's not insignificant. I mean, there could be 200 separate days on which the acrolein and formaldehyde concentrations from the start-up events are high enough to cause significant acute health impacts.

Q Can you respond to the Applicant's -- or, rather, Mr. Radis' assertion that the maximum CATEF emission factors likely overstate the project's toxic emissions?

A Sure. The CATEF database includes four separate source tests that were used to come up with the emission factors. And the CATEF database reports a minimum, a maximum, a mean, and a median. And the ratio of the mean to the max is about three, and the ratio of the minimum to the mean is about 14. All four of the measurements that went into those calculations are corrupted by this acrolein degradation problem that I'm sure you're all sick of hearing about, but each one of them has that problem. So it doesn't matter whether you pick the min, the max, or the mean. You're still dealing with an underestimation.

Clearly, by picking the maxi, you're closer than if you were to use the mean or the minimum, but that doesn't solve the problem. If -- if you pick the max, and you don't use the factor of ten adjustment, and you use the most recent acute REL for acrolein, you still conclude that there's a significant health impact during the start-up events.

Q Can you adjust Mr. Radis' statement that the acrolein emission factor should be multiplied by three instead of ten?

A Yes.

MR. MILLER: Excuse me. I have to object to that question. I don't believe he said he thought it should be multiplied by three, but rather that based upon the paper he reviewed he thought that that's all that could be concluded from that.

MS. REYNOLDS: I'll accept that revision to the question.

THE WITNESS: Mr. Radis used Exhibit -- Attachment 9 to my Sunrise Public Health comments, and Attachment 9 to my Sunrise Public Health comments does show that in 72 hours, 63 percent of the acrolein is lost. However, that study is not applicable to the case at hand here.

There are two separate methods that are used to measure acrolein. One of them is an impinger based method. An impinger is -- it's kind of like this cup that's got a little bubbler through it, and the gas runs through a pipe into the cup and it bubbles. And as a result, the volatiles that are in the sample, like acrolein, end up in the impinger solution. And then you extract the impinger solution and you analyze it.

That's one method. And that's the method that is used in CARB Method 430, and CARB

Method 430 was used to make all of the measurements of the emission factors in the CATEF database.

The method that was used in Attachment 9 to my Sunrise testimony is the TO-11 method, which is an EPA ambient air method. And the EPA ambient air method uses cartridges to collect the samples. The difference between a stack method and an ambient air method is that in stacks, you're dealing with higher concentrations, whereas in ambient air you're dealing with a lot lower concentrations so you need to concentrate them. And that's normally done by using cartridges. And the work by Dr. Freeman in Attachment 9 was based on cartridges and the TO-11 method, because we were doing that work in conjunction with ambient monitoring going on at Avila.

The work that Dr. Freeman did on CARB Method 430, which was used in the CATEF database, was published in the 1993 paper by Dr. Freeman, which is in Attachment 1 to my Sunrise comments. And that paper shows that in 48 hours, 93 percent of the acrolein was lost. And the four stack tests that made up the acrolein emission factor were held for longer than 48 hours before they

were extracted and analyzed. Therefore, in my opinion, the use of a 93 percent loss factor, which is equivalent to about a factor of ten, is more than justified and is far from arbitrary. In fact, what it does is it actually underestimates acrolein emissions.

BY MS. REYNOLDS:

Q I just have a clarifying question. You stated at the beginning of your testimony that if the Applicant uses soot filters that would address your concern about construction emissions. What -- given the Applicant's statements about wanting to have discretion to stop using soot filters, do you have any concerns about that?

A Well, first, the vendors that I'm familiar with who deal in the soot filter business recognize the problems that Mr. Champion referred to. This equipment works on some types of off-road equipment really well, and on other types of off-road equipment, not so well. For example, it doesn't work on cranes, and I personally would never recommend the use of oxidizing soot filters on cranes because they don't operate long enough at high and low to reach the temperature that you need to reach.

But on most of the types of equipment that you would find at a site like this, raiders, pacters, dozers, things like that, there aren't any operating problems. And the vendors are very careful to make sure that the equipment is designed and installed properly before it's used. Most of the vendors that I know who are reputable would not recommend -- recommend installing one of these things in a situation where it would affect the performance of the equipment.

But I -- I agree that some flexibility is certainly needed, because you can have unanticipated problems.

MS. REYNOLDS: I have no further questions.

THE WITNESS: But I think I would leave it up -- up to the -- to the vendor to make a determination, as opposed to the construction manager.

HEARING OFFICER WILLIAMS: Thank you, Dr. Fox.

THE WITNESS: I think I -- I have -- I have a few things I'd like to maybe address here.

HEARING OFFICER WILLIAMS: I don't believe there's a question. Do you have a

question?

MS. REYNOLDS: Well, actually Dr. Fox was taking notes during the other testimony, so I think this is an appropriate time for rebuttal of some of the other issues that --

THE WITNESS: Right. I wanted -- I wanted to address some things that I heard flying around the room earlier, but I need to look at my notes for a minute to see what they are.

BY MS. REYNOLDS:

Q My question would be, do you have any other rebuttal testimony based on what you have heard today?

COMMISSIONER MOORE: This is like trying to get the Jeopardy contestants to put things in the form of the right question.

(Laughter.)

THE WITNESS: With respect to the offsite issue that Mr. Tyler raised, at the risk of boring Mr. Moore, who has sat through an entire afternoon of arguments --

COMMISSIONER MOORE: We're all ears.

THE WITNESS: -- on this point. Attached to my public health testimony is the full text of the CAPCOA guidelines, which both parties

used to do health risk assessments in this case. And those CAPCOA guidelines are absolutely clear that they apply to offsite workers.

With respect to the exposure levels, both the acute and chronic exposure levels that both parties used in this case, attached to my public health testimony is the complete text of the OEHHA adopting criteria, and that information is likewise quite clear that both the acute and the chronic RELs should be applied to offsite workers.

Also attached to my testimony is an e-mail from Dr. Melanie Marty, who's the chief of the Air Toxics Branch, stating that in her opinion those guidelines and those criteria are applicable to offsite workers, including oilfield workers. And I would also like to state that in my professional opinion based on nearly 30 years of doing this kind of work, I have never seen any agency advocate the use of occupational standards to evaluate health impacts to offsite workers.

With respect to the comments made by Dr. Obed, the -- the comment was made that the acrolein acute REL is based only on eye irritation, and there was also the study was taken

and divided by 60. That's true. But it's important to understand that that is the standard procedure, and most of these numbers are divided by factors larger than 60. And in the case of this particular study, the reason why other irritation, such as respiratory irritation, was not reported is because the subjects in the study were outfitted with carbon filters, so there would be no respiratory impacts.

HEARING OFFICER WILLIAMS: Dr. Fox, I believe that was Mr. Tyler's testimony.

THE WITNESS: Was it Mr. Tyler? Excuse me. Mr. Tyler. It was -- it was Dr. Obed in Sunrise.

Let's see if I have anymore comments here. Those are the main points I'd like to make.

MS. REYNOLDS: At this time I'd like to move Dr. Fox's testimony into the record, her public health testimony into the record.

HEARING OFFICER WILLIAMS: Are there any objections?

MR. MILLER: No.

MS. WILLIS: No objection.

MS. REYNOLDS: And we need an exhibit number for this.

HEARING OFFICER WILLIAMS: Next in order, I believe, is 25.

(Thereupon, Exhibit 25 was marked for identification and was received into evidence.)

MS. REYNOLDS: What was -- I'm sorry, what was 24?

(Inaudible asides.)

COMMISSIONER MOORE: So that became 25. Counselor, do you have cross examination?

MR. MILLER: I have a few cross examination questions.

CROSS EXAMINATION

BY MR. MILLER:

Q I'd like to return, if I could, please, to the discussion at the beginning of your testimony relating to health risk assessments that have been done for remediation projects which did include construction equipment emissions.

I believe you referred to the Avila Beach and Guadalupe remediations; is that correct?

A That's correct.

Q And do you recall what the results of the health risk assessments were for construction

emissions in those two instances; were they significant?

A In -- yeah. In San Luis Obispo County, the significance threshold for cancer impacts is ten in a million. And I recall that the cancer analysis came in at something like six in a million, which would be insignificant in that case. But I believe here, the significance threshold is one in a million, in which case had it've been judged by different criteria it would've been significant.

Q And what do you based your assumption that the significance threshold here is one in a million on?

A I have seen it in various documents prepared by staff.

Q I see. Can you cite any of them specifically?

A No, not as I sit here.

Q Okay. With regard to acute health risk, do you recall what the results were for those risk assessments in Guadalupe and Avila Beach?

A The hazard index was -- was less than one. But it was above .5, which would've triggered a background analysis, which was not

done in that case.

Q I see. All right.

A Which would've been significant.

Q But it -- it was less than one, however.

A Pardon?

Q It was less than one?

A Yes, I -- I recall it was.

Q Were those -- I don't know those projects at all. My impression is that those are rather major projects, remediation projects?

A Yes, they are.

Q Thank you. With regard to the modeling that you performed concerning -- I guess I would say both construction emissions and start-up, did you calculate a point of maximum impact?

A Yes.

Q And could you give us an idea as to where that was?

A It was within the oilfield.

Q All right. How far from the project site, would you guess?

A As I sit here, I don't know.

Q Less than a mile, less than a half a mile?

A I don't know.

Q All right. But within the oilfield.

A Yeah, it was within the boundaries of the oilfield.

Q Thank you. At Avila Beach, soot filters were employed; is that correct?

A That's correct.

Q And do you recall whether some of the equipment was not found to be appropriate for their use --

A Yes.

Q -- in that case?

A The cranes are the example that comes to mind.

Q All right. Anything else that comes to mind in that regard?

A Not that I recall, offhand.

Q Okay. Just let me retread one other thing. You indicated, I believe, that in the -- well actually, two other things.

First question. With regard to construction emissions, that if the Applicant does, as was suggested this morning by Mr. Champion, employ the soot filters on equipment as appropriate, that that would reduce the impacts to less than significant, in your judgment. Is that

correct?

A That's correct.

Q And with regard to the oxidizing catalyst for the turbine, that would reduce the impacts to less than a significant with regard to operation.

A That's correct.

Q So your only issue there is start-up.

A My only issue there is start-up. That's right.

MR. MILLER: That concludes my cross examination. Thank you.

HEARING OFFICER WILLIAMS: Thank you.

Staff, do you have cross examination?

MS. WILLIS: No, we don't have any cross examination questions.

HEARING OFFICER WILLIAMS: Okay.

MR. MILLER: If I would be allowed one rebuttal question of Mr. Radis.

HEARING OFFICER WILLIAMS: Proceed.

MR. MILLER: I think it is relevant.

TESTIMONY OF STEVEN R. RADIS

called as a witness on behalf of the Applicant, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

BY MR. MILLER:

Q Mr. Radis, there was discussion in the previous testimony regarding start-up and the assumptions that were made with regard to the operation of oxidizing catalysts during that period. In the health risk assessment as present in the AFC, could you tell us what the assumption was with regard to the oxidizing catalyst?

A The assumption was that there would be zero control efficiency on start-up.

MR. MILLER: All right. Thank you.

MS. REYNOLDS: Could I have due recross of that rebuttal question?

HEARING OFFICER WILLIAMS: Proceed.

CROSS EXAMINATION

BY MS. REYNOLDS:

Q Mr. Radis, in your health risk assessment the emission factor that you used for start-up conditions, was it the same emission factor as you used for baseload operations?

A I guess the question is yes and no. The -- it's no, when we use the average emission factor from the CATEF database for normal operating conditions. And for the peak one-hour

scenario to address acute impacts, we used the annual -- or, I'm sorry, we used the maximum emission factor as well as start-up stack parameters.

Q Thank you.

A We had prepared a screen analysis evaluating the entire range of operating conditions, and selected start-up as the scenario where we would have peak impacts for acute health effects.

Q Do you know whether the CATEF emission factors are based on emissions testing during start-up, or baseload operations; do you have any knowledge about that?

A I do not know the specifics of that.

MS. REYNOLDS: Thank you.

THE WITNESS: But, again --

HEARING OFFICER WILLIAMS: Staff.

MS. WILLIS: Staff would also like to provide rebuttal testimony.

TESTIMONY OF

RICK TYLER

called as a witness on behalf of the Commission staff, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

BY MS. WILLIS:

Q Mr. Tyler, you've listened to Dr. Fox's testimony. Do you have any comments regarding the testimony you just heard?

A Yes, I have several. I think one of the most important is with regard to this issue of the method used to analyze acrolein.

One of the things, being in -- a regulator for many years and working for ARB, one of the things that is very critical is that when you establish a standard you also establish a reference method. The purpose of that is that when you make any measurements to determine compliance or to determine if there's a problem, that in fact everyone's playing on the same -- the same field. Everyone's using the same information to gauge the same exposures.

It's my belief that, in fact, when they measured the toxic end points in establishing the REL, that they in fact used a method equivalent to the reference method. Thus, the health based criteria are -- are linked directly to the referenced test method.

So this idea of throwing in a new test

method in the middle of the game is not the appropriate way to handle this. This would best be dealt with directly with ARB, in determining or modifying that, and then having that reflected in the actual REL. Not picking and choosing which one we apply in what situation.

So what I'm saying is there's a direct linkage between those two. We can't sever them. If we do, we're all talking apples and oranges. We're not talking the same thing.

With regard to the issue of the RELs establishment and the wearing a face mask, it's my interpretation of that action on the part of the investigators that in fact they were trying to specifically subject the individuals to eye irritation only. If you allow them to breathe an irritant, then you will have reaction potentially of the eyes from that circumstance. So if you're trying to isolate eye irritation from respiratory irritation, then you must not expose the respiratory tract during that experiment. It would be totally inappropriate. Furthermore, the existing REL was clearly based on respiratory irritation, and had a higher threshold.

So it's obvious to me why they put the

face mask on the individual when they went to gauge eye irritation. And it's not because respiratory irritation would've negated that somehow, as -- as implied by Dr. Fox. I don't believe that's true.

The other thing I want -- I want to comment on is I find no basis to arbitrarily attach CO emissions to acrolein emissions, and to factor numbers based on incomplete combustion. That's just -- there's no scientific information to allow us to do that. So I find that using CO as a surrogate for acrolein to be suspect.

Further, I find it hard to understand how anyone would address the issue of start-up emissions. We're already using natural gas, the cleanest fuel we can use. We're already using a catalytic converter. How would we pre-heat the converter, even? We'd have to fire natural gas to do that, or use electricity which causes emissions somewhere else. This is clearly the end of the road for mitigation, as far as I can tell.

So I guess with that, those are my major reactions to Dr. Fox's testimony.

HEARING OFFICER WILLIAMS: Surrebuttal?

THE WITNESS: Oh, yes. There's one

other thing that I would like to -- to address, and that is the significance criteria. Clearly, staff has stated repeatedly that we used one in a million as a de minimus criteria. Anything below one in a million is categorically acceptable. Anything above ten to the negative fourth we would generally consider categorically unacceptable. Anything in between those two ranges is a judgment call.

So somewhere between ten to the negative six and ten to the negative fourth may still be acceptable. And -- and particularly in situations where you have small numbers of people exposed, that is particularly relevant, because then we would resort to looking at a cancer burden. Obviously, if you have a risk of one in -- one in -- in ten to the negative fourth and you only have one person exposed, we don't even expect one case of cancer. So we don't expect -- there's a very, almost unreasonable assertion that there would ever be any adverse outcome as a result of it.

Finally, the measurements made here were at the point of maximum impact inside the facility. And regardless of what Dr. Marty at OEHHA believes, I believe that clearly this is an

industrial facility, clearly these are people at work, clearly Cal-OSHA has authority for this, and I question that OEHHA has the regulatory authority to impose that position in this case.

So I -- I would disagree with her, and I will discuss this with her directly. I don't believe it's appropriate. And I still don't -- and in my 30 years, or 22 years of experience, I don't -- I don't recall a case where that's legitimately been done, where -- where we've not applied workplace standards when it's a workplace. Particularly like this one.

HEARING OFFICER WILLIAMS: Surrebuttal?

MS. REYNOLDS: Actually, I have a few cross questions, and then we'll have surrebuttal.

CROSS EXAMINATION

BY MS. REYNOLDS:

Q Mr. Tyler, you stated that -- that with respect to acrolein, the acrolein emission factor and the REL that was established, that you suspect that -- that the REL was established based on the same data so there was a connection between the emission data and the REL.

Do you know for a fact that that was the case?

A No, but every experience I've had, that would be the way you do it. That only makes sense from a legal and regulatory standpoint.

MS. REYNOLDS: Okay. That's all. And I have some questions for Dr. Fox on surrebuttal.

TESTIMONY OF

DR. PHYLLIS FOX

called as a witness on behalf of CURE, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

BY MS. REYNOLDS:

Q Dr. Fox, can you address some of the issues raised by Mr. Tyler in his recent rebuttal testimony?

A Surely.

As to the link between the acrolein REL and the CARB Method 430, it's pure speculation. I personally don't know what method was used in the acrolein study that was used as the basis for the acrolein REL. But based on my experience, you would not use a stack testing method, which is what CARB Method 430 is, to measure exposures to people in a health study. There are other methods that are used in that type of research setting for

measuring acrolein.

You certainly would not use CARB Method 430. That is a method that was developed by CARB specifically to make stack measurements. So there is no link, and it is pure speculation on the part of Mr. Tyler that there is a link. You'd never use that method in a lab setting.

That's the first point I would like to make.

Second, as to Mr. Tyler's comment on the alleged lack of a relationship between CO and VOCs, that is also incorrect. CO is routinely used as a surrogate for VOCs in turbine environments. And in fact, to bring it locally, at the Crockett plant, in the permit that was issued to that plant there was a requirement that a relationship be established between CO emissions and VOCs so that you could use CO as a surrogate to determine compliance with the VOC limit.

And the -- the Crockett facility actually did a study where they established a relationship between CO and VOCs. They found an excellent one, and they used that relationship to determine compliance with their VOC limits. There is such a requirement also in the Sunrise permit,

in the La Paloma permit, and that requirement is commonly used in the permitting of these power plants in New England.

So that is just simply not true.

And then I'd like to just add, at the risk of boring Mr. Moore, I would like to comment on why it is not appropriate to exclude offsite workers in this kind of an environment in a health risk assessment.

OSHA regulations do not apply to offsite workers. The occupational standards, like the NIOSH standards that you've heard batted around here so much, there's more to those standards than just the number. Those numbers are part of a comprehensive industrial hygiene program that includes medical monitoring, protective equipment, ambient air monitoring in the workplace environment, requirements for changing clothes before you leave the workplace environment. Most of them have six or seven separate parts in addition to the specific limit itself.

And you can't just poke the limit out from the framework of that industrial hygiene program and apply it in the middle of an oilfield. You just never use occupational standards for

offsite workers. It's -- it's just not appropriate.

COMMISSIONER MOORE: Cross examination from staff? On the rebut.

CROSS EXAMINATION

BY MS. WILLIS:

Q One question, Dr. Fox. Do occupational standards apply to all workers?

A Occupational standards apply to workers in -- in a workplace. For example, if you've got a power plant they would apply to the workers within the boundaries of the power plant, but they would not apply to offsite workers who are members of the public.

For example, suppose you have a power plant with ammonia storage tank, like we have here. Supposedly, the workers within the boundaries of the power plant would know about the ammonia storage tank, there would be protective equipment available to them, they would be trained and aware of the hazards associated with the ammonia.

Offsite workers that are not part of that power plant environment, who are not covered by those regulations, would not have available to

them the other pieces of the standards that would apply in a workplace environment. And, for example, an oilfield worker outside of a power plant is not going to have the type of respirator in his hip pocket that he would need to protect himself from a release of ammonia, for example.

MS. WILLIS: Thank you.

COMMISSIONER MOORE: Applicant?

MR. MILLER: Nothing.

COMMISSIONER MOORE: All right. With that, I -- we're going to close this topic, take a five minute -- take ten minutes, and come back and go back to --

HEARING OFFICER WILLIAMS: Our final topic, which is Hazardous Materials Management.

(Thereupon, a recess was taken.)

HEARING OFFICER WILLIAMS: Hazardous Materials Management.

MS. LUCKHARDT: The Applicant's witnesses in the area of Hazardous Materials Management are Gary Cronk, Joe Rowley, and Steve Radis, each of whom have been sworn already in the proceeding. They have also previously stated their qualifications for the record.

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TESTIMONY OF

GARY CRONK

called as a witness on behalf of the Applicant, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

MS. LUCKHARDT: I'll start with Mr. Cronk.

BY MS. LUCKHARDT:

Q Mr. Cronk, can you please identify the exhibits you are sponsoring today?

A Along with Steve Radis, I am sponsoring AFC Section 5.12, Hazardous Materials Handling, Section 518.3, Cumulative Impacts, and Section 6.5.12, Hazardous Materials Handling, the LORS. And then also Exhibit 2, Response to Data Request -- Staff Data Requests Number 15 and 16.

Q And are you also sponsoring pre-filed testimony in this case?

A Yes, I am.

Q And would that be the Attachment A, Testimony of Gary Cronk regarding Hazardous Materials in support of the Application for Certification for the Elk Hills Power Project?

A Yes.

Q And do you have any corrections to your testimony today?

A Yes, I do. Two corrections, actually. Number one correction would be on Staff Data Request Number 16, we need to -- I need to eliminate the inclusion of sulfuric acid as a regulated substance under OSHA's PSM, Process Safety Management regulations. It doesn't meet the requirement of a fuming sulfuric acid, so it shouldn't be included in that.

Q And is that correction already included in your pre-filed testimony on page two?

A Yes, it is.

Q Okay.

A And then the second correction is -- is actually a staff supplementary testimony filed on January 24th, basically regarding hydrogen storage. Hydrogen will not be stored in a permanent tank but will be brought onto the site in two trailer mounted 30,000 -- 30,000 cubic feet trailer mounted rigs with -- for the hydrogen. And they will meet the ASME Pressure Vessel Codes, as well as DOT codes, be equipped with pressure relief valves, and will be sited 50 feet away from any structure ignition source.

And I agree with the staff proposed addition of certification, which is Haz 4, which describes these two portable trailers that will come in.

Q And do you need to correct your testimony in Attachment A, page 2, regarding the size of onsite storage?

A Yes. It would be -- the 60,000 would be the correct number.

Q Thank you. And can you please provide a short summary of the non-ammonia related hazardous materials testimony?

A Okay. Several hazardous materials will be handled at the Elk Hills Power Plant, primarily anhydrous ammonia, various water treatment chemicals, sulfuric acid, hydrogen -- I'm sorry, caustic, which is sodium hydroxide, and hydrogen, which I just talked about. All the liquid hazardous chemicals will be contained in tanks and will be -- have spill containment berms around each of the tanks. Incompatible materials like caustics and acids will be separated in separate containment areas. And the ammonia will be regulated and will have requirements for a risk management plan and a process safety management

plan to -- to minimize the release of those chemicals.

MS. LUCKHARDT: Thank you. And now I'd like to turn to Mr. Rowley.

TESTIMONY OF JOSEPH H. ROWLEY

called as a witness on behalf of the Applicant, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

MS. LUCKHARDT: Mr. Rowley is not sponsoring any pre-filed testimony specifically in the area of hazardous materials. He has previously sponsored testimony in the areas of project description and facility -- facility design, which relate to the design and engineering of the aqueous ammonia systems, which includes Data Request Number 10 and other parts of the AFC Exhibit 1 that have previously been entered into the record under his sponsorship last Thursday.

BY MS. LUCKHARDT:

Q So I would ask Mr. Rowley at this time to provide a brief description of the design of the ammonia system.

A The major components include a storage tank, a secondary containment area that's formed

by a concrete wall and floor, a ammonia detection and alarm system, an automated water deluge system, and equipment that's associated with the proper metering of ammonia to the FCR system.

Q And, Mr. Rowley, have you reviewed CURE's Hazardous Material -- Hazardous Materials Management and Traffic and Transportation testimony?

A Yes, I have.

Q And I'd like to refer you to page 11 of CURE's testimony, where they describe the water deluge system. Does your testimony include a description of how this system will be activated and the time required for actuation?

A Yes, it does. The water deluge system is automated, and when the detectors of ammonia -- when the detectors note the presence of 75 parts per million there is an immediate signal sent to the water deluge valve, and actuation is immediate. When -- when 75 parts per million is detected, the water deluge valve is immediately opened. There's virtually zero time delay.

Q And, Mr. Rowley, have you agreed to conduct testing of the ammonia tank that exceeds the testing required by applicable codes and

standards?

A Yes, to provide further assurance of the integrity of the ammonia tank, we propose 100 percent radiography of all welds on the tank, which exceeds the code requirements.

Q And then one last question regarding the testimony of Dr. Fox. Are you willing to accept a condition limiting your purchase of ammonia to within 50 miles of the site?

A No, we are not.

Q And could you explain why you're not willing to accept that condition?

A It's important to us, from the standpoint of properly managing hazardous materials such as ammonia, that we deal with responsible suppliers. The supplier's so-called local distributors are actually brokers. We want to be able to deal directly with the supplier, and those suppliers are going to be transporting the ammonia from the actual point of origin, which would not be Bakersfield since ammonia is not manufactured in Bakersfield, but rather from, for example, the Port of Stockton.

MS. REYNOLDS: Actually, I'm going to object. I think -- thought we were going to cover

transportation-related issues to -- in the Traffic and Transportation section. Are we going to get into those now, or --

MS. LUCKHARDT: I guess I'm having a little trouble splitting everything out. We can bring Mr. Rowley back for transportation, and we could talk about that specific request or statement in Ms. Fox's testimony at that time, if you would prefer. It's just her testimony's combined, and so in preparing my stuff I tried to split it, but if you would prefer, I can re-ask and we can do that -- this question --

MS. REYNOLDS: Well, why don't we see -- I guess can we see how far this goes, and then --

MS. LUCKHARDT: That's the only question I have --

MS. REYNOLDS: Okay.

MS. LUCKHARDT: -- that's all I have.

COMMISSIONER MOORE: I think -- so we're going to overrule it, and let it stand.

MS. LUCKHARDT: Okay. Now I'd like to turn to --

MR. ROWLEY: I wasn't quite done.

BY MS. LUCKHARDT:

Q Were you done?

A Yeah.

Q I'm sorry.

A I -- my point is, is that we don't want a middle -- unnecessary middle man between us and the actual supplier of the ammonia. We want to be able to deal directly with -- with the supplier so that if there are any issues that need to be resolved, it's just those two parties resolving the issue.

MS. LUCKHARDT: Okay. Now I'd like to turn to Mr. Radis.

Mr. Radis has been previously sworn, stated his name and qualifications for the record.

TESTIMONY OF

STEVEN R. RADIS

called as a witness on behalf of the Applicant, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION

BY MS. LUCKHARDT:

Q Would you please identify the documents you are sponsoring under Hazardous Materials?

A I'm sponsoring the same documents as Gary Cronk.

Q Are you also sponsoring your pre-filed

testimony?

A Yes, I am.

Q Do you have any corrections to any of that testimony at this time?

A No, I don't.

Q And do you adopt that testimony are your true and sworn testimony today?

A Yes.

Q Okay. Does -- do you belong to a separate group at A.D. Little?

A Yes. I'm in the process safety and risk management practice, which is a subgroup of our global environment and risk consulting.

Q And does that group prepare and publish guidelines in risk assessments?

A Yes. We've published probably a half a dozen guideline books for the American Institute of Chemical Engineers, covering both the transportation and handling of hazardous materials.

Q And has your group prepared some of the documents relied upon by Dr. Fox?

A Yes.

Q Can you help me understand probability by describing how you determine the probability of

two unrelated events?

A Typically, when we do a probability analysis and we're looking at unrelated events, we would multiply the probabilities of each independent event to derive the probability of both events occurring at the same time.

Q Okay. Thank you. And then have you reviewed the testimony of Dr. Fox in the areas of hazardous materials management and traffic and transportation?

A Yes, I have.

Q In your testimony, you -- you state that your analysis does not make any distinction between the general public or offsite workers. Can you explain that -- that statement?

A When we prepared the offsite consequence analysis as a response to staff comments, or requests for data, we looked at the consequences of a variety of ammonia releases, as well as the probabilities of those releases occurring. At that point we did not make any differentiation between onsite workers, offsite workers, or the general public.

Q And how do the oilfield workers differ from the typical general public?

A In many ways. I guess the first part is that there's a general assumption that oilfield workers, especially in this -- or I shouldn't say especially in this case. Oilfield workers are generally considered healthy adults. They are usually trained to respond to accidental releases within the oilfield. And it's generally an acceptable, or accepted risk as part of the job.

Q And when you're preparing a quantitative risk analysis, is it customary to consider potential risks to onsite workers?

A We do not consider the risk to onsite workers as part of a quantitative risk analysis to evaluate impacts to the public.

Q And CURE has identified -- has included references to several studies prepared for Santa Barbara County for the Chevron Gaviota Facility. Did these analyses consider risks to workers who were not directly a part of the unit that was being studied?

A No, they did not.

Q They did not. Can you explain that to me?

A Yeah. I think it -- I probably have a couple examples. I'll use the Chevron facility

where we have had some information submitted as testimony.

The Gaviota oil and gas processing facility is owned by the Point Arguello Partners, which is essentially 12 oil companies that own the entire onshore facility and three offshore platforms. The project, up until recently, was managed by Chevron through three subsidiaries within the facility. They had -- one subsidiary was their natural gas pipeline company. They had one that was their crude oil pipeline, an oil processing company, and the third one was the Gaviota Gas Plant.

Each of these companies are individual corporations that are owned by the Point Arguello Partners. They are within the same general facility, but they are distinct in that, for example, the Gaviota Gas Plant purchases electrical power from the oil company for -- from their cogen. So there are three separate companies within the same continuous boundary.

When Santa Barbara County did a risk analysis and environmental impact report for a project called the Molino Gas Project, which was essentially adjacent to the Gaviota facility, the

risk analysis did not consider potential hazards to the Chevron workers. They are basically considered -- the Chevron facility is a consolidated oil and gas processing plant, according to the county's guidelines, and all new developers of oil and gas are required to use a consolidated facility. And since they're involved in the same type of industry with the same type of hazards, they have not been included in the risk analysis to look at the general public.

The other example I have is down the coast more, and that would be a facility that used to be owned by Shell Oil Company, which was an oilfield as well as oil and gas processing facilities. And again, there were separate companies that operated these facilities, but they were all within the contiguous oilfield boundaries. When risk analyses were done for that facility, they were treated as the onsite oilfield workers.

Q Okay. And when you were speaking about the Santa Barbara facility, were there also Texaco employees employed at that facility?

A Yes. Up until recently there were also Texaco employees that would work in the

operational center for the project that controlled one offshore platform that was owned by Texaco.

Q And were those employees treated any differently than any of the other employees for the risk analysis?

A No. They were all treated as the same employees for that project.

Q Does the ammonia system proposed for the project present a significant risk to oilfield workers?

A I don't believe so.

Q And can you explain how you came to that conclusion?

A I was afraid of that.

Basically, when we performed the consequence analysis for the ammonia handling systems, we identified a range of release scenarios that could likely occur. The first scenario was a catastrophic failure of the ammonia storage system, which had a very low probability of occurrence and would be considered unlikely, or highly unlikely.

We also considered the impacts of piping failures, valve failures. Again, these would be catastrophic failures of this equipment. The

release size would be considerably smaller, but the water deluge system would probably control on the order of about 80 percent of the released ammonia.

The most likely event would be leaks coming from defective valves, piping. And in that case, the deluge system would be 100 percent effective in controlling the release from the system, once the protection system activated the deluge system.

And I'm going to continue.

The probability of the catastrophic vessel failure is already lower than the typical criteria we use to evaluate risk. Typically, we look at the probability of a given event, and when we look at risk it's the probability of a given number of fatalities or injuries. I know staff looks at 75 parts per million, but there is no real threat of injury or fatality at that level. That's really an irritant level.

There are established guidelines that can be used in developing acceptable risk for offsite populations, and those have been developed by the United Kingdom Health and Safety executive, and have been adopted, with modifications, by

Santa Barbara County.

When we look at the probability of a vessel failure, just the vessel failure of its own has a lower probability than the acceptable or de minimus fatality rate for a given fatality. The -- if you were to evaluate what the probability of a fatality would be from the vessel failure, you would essentially, through the quantitative risk analysis process, evaluate the probability of the failure as well as the probability of the meteorological conditions that would result in the adverse exposure, as well as the probability at the given exposure a fatality would actually occur.

It's not a given that at a given concentration you have a fatality, or 100 percent fatalities. Typically, we use percentile values to evaluate whether or not there would be fatalities, and we usually look at a range of on the order of a zero, or a lower lethal concentration, or one percent higher value, and then we integrate up to what we would consider 100 percent fatality level.

Q And so would that be what you evaluate when you evaluate the risk of a facility? What's

the question you're trying to answer?

A The question is not whether or not there'd be a release; it's what would be the event that would occur and the probability of the risk. And again, we don't want to know if there's going to be a release of ammonia if there's not going to be exposure or adverse effects. And so what we typically do in a quantitative risk analysis is evaluate the probability that a fatality or injury would occur. And this could be done for single -- or single fatality and injuries, as well as up to any given number of fatalities.

And typically, we develop what's called an FN curve, which is the frequency of a given number of fatalities. And usually, the criteria starts at the probability of one or more fatalities, up to the probability of, say, a thousand fatalities for a project that would be in a highly populated area.

Q And what basic factors do you include to reach a conclusion on risk?

A I kind of answered that already, but again, it's the probability of the --

Q If you could just let me know --

A -- equipment failure -- yeah.

Probability of equipment failure, the probability of exposure, which is based on meteorological conditions, wind speed, wind direction, stability class. And then the probability of a -- response relationship given a certain exposure.

Q Great. Have you reviewed CURE's criticism of staff's use of meteorological data?

A Yes, I have.

Q And what is your opinion of that criticism?

A Staff did basically a very mini-QRA. What they did is they established what the probability of the equipment failure was, and the based on a probability of a meteorological condition determined that the given probability of an event in the case -- again, we're talking about injury or fatality -- was below any criteria that they considered acceptable.

Q And Dr. Fox refers to the Guidelines for Chemical Transportation Risk Analysis in her testimony. Are you familiar with that book?

A Yes. That book was actually written by my group.

Q And does that book discuss the preparation of risk analyses?

A It focuses on the preparation of risk analysis for transportation hazards, and it also refers to a second book that was published by the American Institute of Chemical Engineers, that is Guidelines for the Preparation of Quantitative Risk Analysis.

Q And would the general principles discussed in the Guidelines for Transportation Risk Analysis differ for risk analysis prepared for a stationary source?

A The -- the general principles are the same, with the exception of specific issues that have to be dealt with in transportation and evaluating impacts over a much wider area.

Q And do those guidelines include combining the probabilities of an event and an exposure when evaluating the potential risks associated with a facility?

A Yeah. The guidelines specifically require the combination of release probability, as well as what we consider contributing factors, which, again, are meteorological conditions and exposure probabilities.

Q Dr. Fox refers to and attached the final report, Risk Assessment for Gas, Liquids,

Transportation from Santa Barbara County in her testimony. I believe it's at the third -- Tab C.

Are you familiar with that document, as well?

A Yes. That was prepared by my office, as well.

Q And does the Santa Barbara study include consideration of weather impacts?

A Yes, it does.

Q And does it also include combined probabilities?

A Yes, it does. And, in fact, given that that study also included flammable effects, it included additional probabilities related to probabilities of ignition, as well as different type of fire and explosion hazards.

Q And your analysis for this case included three potential release scenarios for the offsite consequence analysis; correct?

A Yes, it did.

Q And do you agree with Dr. Fox that a valve or piping failure leak -- leak or failure are more likely to occur than a complete tank failure?

A Yes.

Q Would a valve or piping leak -- a valve or piping leak or failure present a significant risk to employees or the public?

A Given that the project has a water deluge system, the impact to the offsite population and nearby workers would be considered insignificant. If you were to consider the failure of the water deluge system you would basically multiply the failure of the equipment by the failure of the water deluge system, and that probability is sufficiently low that the risk would also be considered insignificant.

Q Did you include the action of the deluge system in your analysis of the worst case?

A We provided modeling results with and without the effects of the deluge system, and for the worst case, given the magnitude of the release, the water deluge system would not be effective.

Q What are the important factors in evaluating the effectiveness of the deluge system?

A I think probably one of the most important factors is evaluating the amount of water that would apply given the size of the release, so it's the ratio of water versus

ammonia, as well as the orientation of the spray nozzles, which has an effect on effectiveness, as well. And again, you can look at velocity of the release versus the velocity of the spray system.

There are -- there are several factors, but by far the most important is the ratio of water to ammonia.

Q And just to be clear, you have evaluated the risk of that system working and not working; correct?

A Yes.

Q And then, how does the water deluge system reduce the impacts from piping or valve failures?

A In terms of how effective --

Q Yes.

A -- or --

Q And how -- and how does it actually work?

A Basically, in the event of a valve or pipe failure or leak, the ammonia would be detected by sensors that surround the tank. Once a 75 ppm concentration is observed, the water deluge system would be initiated. The effectiveness for a leak -- I'm going to flip back

to the --

Q Sure.

A The effectiveness we estimated for a maximum line failure, which would be -- which would also include the effects of an excess flow valve, would be approximately 87 percent. So 87 percent of ammonia would be captured within the water stream.

For the -- what we considered a most likely release that would occur related to a leak in a valve or a pipe, the system would essentially be 100 percent effective.

Q And the document that you're referring to is the response to staff's Data Request Number 9; is that correct?

A Yes, it is.

Q And the date on the -- that document is -- it should be in the footer.

A I believe it's the --

Q The footer on the page.

A -- August 2nd, 1999.

Q Thank you.

A Differs from the one on the title.

Q Oh. Okay.

Dr. Fox seems concerned that she does

not have the exact time that the deluge system requires to initiate spray. Does that concern you?

A No, it really doesn't.

Q And can you explain why?

A The time required for the deluge system to be initiated in the event of a release is relatively small. Most of the criteria that we look at are a certain concentration over a certain exposure period, but really what it equates to is dosage. And staff has used a value of 75 parts per million, I believe, for a 30 minute period.

It's most likely that this system would activate in a matter of seconds, or just to use a round number, say one minute. The initial puff coming off of this release would not be controlled by the deluge system, and in terms of equating it to dose, 75 parts per million for 30 minutes equates to what we would call a dosage of about twenty-two hundred and fifty ppm minutes. It's basically just the concentration times the number of minutes to calculate a dosage.

In the event that you had a release and it took one minute to activate the system -- I'm probably going to get kicked for picking too long

a time period -- you would essentially be exposed to 75 ppm minutes if you were to be standing immediately downwind. So clearly, 75 ppm minutes for dosage is not very significant when compared to the exposure criteria, or arbitrary exposure criteria in this case, of twenty-two hundred and fifty.

Q And we've been discussing the effectiveness of the deluge system on the more likely scenario of the pipe leak and pipe failure. Can you state the difference in probability of the most likely scenario and the worst case release?

A I believe I'll flip -- I believe the probability of a failure from the -- the catastrophic case was on the order of three or four times ten to the minus fifth. That included failures of the vessel, as well as significant failures of equipment connected to the vessel.

The more likely scenario, or what we call a reasonable worst case under the RMP rule, has a failure rate of about two times ten to the minus three, or -- okay, we'll go to the -- we'll go to the English units here.

The -- for the worst case, we're looking at once every 27,000 years. For the reasonable

worst case, we're looking at once every 410 years. And for a leak or, you know, a small leak from piping or valving, that might occur once every 64 years.

Q Okay. And then, on to the comments Ms. Fox makes about additional mitigation. Dr. Fox suggests the use of a double-walled tank. Would you recommend storing anhydrous ammonia in a double-walled tank?

A Not really. I think, given the location of this tank in terms of relationship to the public and the low likelihood for exposure, it's probably not warranted.

MS. LUCKHARDT: And, Mr. Rowley, would you recommend storing anhydrous ammonia in a double-walled tank?

MR. ROWLEY: No, I would not. The main reason being that the -- from the standpoint of a plant operator, which I have been, including plants with anhydrous ammonia, I want to be able to see the vessel that is actually containing the anhydrous ammonia. If you put that vessel within a second vessel, you no longer have the ability to directly observe the vessel that is actually containing the ammonia, so you can't ascertain its

condition.

For example, if there were external corrosion on the vessel you wouldn't be able to see it, whereas a single-walled tank can be directly observed and can be kept free of corrosion, and so forth, which is really the only significant hazard to the long term integrity of the tank.

BY MS. LUCKHARDT:

Q And Dr. Fox recommends storing the ammonia tank in a building. Mr. Radis, would you recommend storing the ammonia tank within a building?

A I would not. I think one thing people forget is that ammonia is also flammable, and there would be additional hazards of even a leak within a building and the potential for ignition and a combined vapor explosion.

In addition, it probably would be -- not probably, it is inconsistent with Article 80 of the Uniform Fire Code to store this type of material within a building.

Q And Dr. Fox also suggests the use of subsurface containment. Would you recommend that?

A Again, in this case I would not

encourage storing the ammonia tank in a confined space. There's also worker safety issues with confined space entry, and would actually increase worker hazards.

Q And then, finally, would you recommend the use of aqueous ammonia for this project?

A I don't think I would for this project, either. Again, given the remote location and the low level of risk associated with anhydrous ammonia, I would not recommend aqueous. There are other issues with aqueous that were probably addressed under transportation. But specifically, one of the issues is that you now have an environmental risk associated with aqueous. In the event of a spill, you would have environmental problems if it were to basically be spilled in the creeks or rivers. It requires considerably more handling depending on the concentration of aqueous ammonia that's used. We're looking at increasing the number of deliveries, and therefore loading and unloading operations by a factor of between three and five.

In addition, spilling the aqueous ammonia is not necessarily this benign event that doesn't have any hazard. This ammonia is

typically stored at concentrations that, especially on a warm day, off -- significant volumes of ammonia. And while there may be smaller hazards or consequences associated with an aqueous ammonia spill, there's a much higher probability that there would be an undesirable event, meaning a risk, basically, of fatality or an injury.

The frequency of an accidental release is considerably higher with the type of equipment that's used for aqueous ammonia, as well as the increased frequency of handling. We have done other studies where we found that the probability of one or more fatalities is considerably higher for aqueous ammonia that it is for anhydrous.

Inversely, the probability of, say, a hundred or a thousand fatalities is lower for anhydrous, because clearly you wouldn't expose as many people.

MS. LUCKHARDT: Thank you. That concludes the presentation of our direct testimony.

At this time we would like to enter Applicant's exhibits and testimony regarding Hazardous Materials into the record at this time.

HEARING OFFICER WILLIAMS: Any objection?

MS. REYNOLDS: No.

MS. WILLIS: None.

HEARING OFFICER WILLIAMS: So admitted.

(Thereupon, the Hazardous Materials Management sections of Exhibits 1 and 2 were received into evidence.)

MS. LUCKHARDT: The witnesses are available for cross.

HEARING OFFICER WILLIAMS: Staff?

MS. WILLIS: No cross.

MS. REYNOLDS: Yeah, could I have a minute?

HEARING OFFICER WILLIAMS: Go right ahead.

MS. REYNOLDS: I have a couple of questions first for Mr. Cronk.

TESTIMONY OF

GARY CRONK

called as a witness on behalf of the Applicant, having previously been duly sworn, was examined and testified further as follows:

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CROSS EXAMINATION

BY MS. REYNOLDS:

Q You state in your testimony that the entire Elk Hills oil and gas field is closed to public access. That's on Attachment A, page 1. The Elk Hills Road which runs through the oilfield and within a few hundred feet from the plant site, is a public road; correct?

A That's my understanding, yes.

Q In your testimony, you refer to several plans that the Applicant will prepare, including a risk management plan, a process safety management plan, a hazardous materials business plan, and a spill contingency plan. And you state that these plans will detail the preventative measure that will be undertaken to minimize the probability of an accidental release.

Is there any requirement that these plans be prepared before the CEC certifies the project?

A No.

TESTIMONY OF

STEVEN R. RADIS

called as a witness on behalf of the Applicant, having previously been duly sworn, was examined

and testified further as follows:

CROSS EXAMINATION

BY MS. REYNOLDS:

Q Mr. Radis, you state in your testimony that it is standard practice in the preparation of a quantitative risk analysis to consider the combined probabilities of equipment failure or human error leading to an accidental release, specific conditions, et cetera.

Are you familiar with a U.S. EPA publication entitled "Risk Management Program Guidance for Offsite Consequence Analysis"?

A Yes, I am.

Q Do these EPA guidelines allow or advocate the consideration of probabilities when performing offsite consequence analyses?

A The EPA guidelines were prepared to evaluate the maximum potential hazard zone at a given facility, using very strict guidelines that again would allow for a comparison of all facilities that fall under that program.

They ignore the concept of risk and rely solely on the concept of maximum consequences. So therefore, they do not do that. But that's inconsistent with all the guidance that's been

issued by the American Institute of Chemical Engineers, the Department of Transportation, FEMA. So it clearly is a tool that's being used for a different application other than quantifying risk. Which you can probably tell I'm irritated about.

(Laughter.)

BY MS. REYNOLDS:

Q So your answer to my question is no.

A It does not.

Q Does the State RMP program, or Cal ARP allow or advocate the use of probabilities?

A The Cal ARP, again, follows the same procedure as the federal RMP program.

Q So that's a no?

A That's a no.

Q You mentioned a FEMA publication. Are you -- and title. Is that the publication entitled "Handbook of Chemical Hazard Analysis Procedures"?

A Yes, it is.

Q Does it -- does that handbook advocate the use of meterological condition probabilities in performing consequence analyses?

A Well, it wouldn't for consequence analyses, because that's strictly the modeling of

the release. That particular guideline is not really a risk analysis book. It's a screening methodology for looking at a wide variety of hazardous material scenarios from fixed facilities as well as transportation.

Q So is that a no? Does it advocate the use of met condition probabilities in performing consequence analyses?

A I haven't looked at this book in a long time, and I -- I should be ashamed, because this was also written by our Arthur D. Little.

I don't believe that this does, because this is, again, a screening procedure that's used by these different agencies.

Q You also mentioned an A.D. Little publication entitled "Guidelines for Safe Storage and Handling of High Toxic Hazard Materials". Does this document advocate the use of met condition probabilities in performing consequence analyses?

A Which book is this? This book was not really designed to evaluate or quantify risk. This is a -- basically a guideline book on procedures that you would use at facilities.

Q To?

A In terms of safe practices for the storage and handling of materials. It's not designed to evaluate the risk of that storage.

Q Okay. The -- you mentioned the American Institute of Chemical Engineers -- is that -- Guidelines for Chemical Transportation Risk Analysis. Does that document or book advocate the use of met condition probabilities in performing consequence analyses?

A Yes, it does.

Q Can you show us where?

A Do you want me to get my own copy --

Q Yeah.

A -- that's probably marked?

Q That's fine.

A I think specifically -- first of all, this book also does refer back to another book for basic quantitative risk analysis guidelines, but on page 232 of this book, this is an example of the calculation of individual risk. And it is the -- some probabilities of -- I'll just zip down the line here -- trips per year, accidents per mile, release probability, release size, number of releases considered, length of release zone, number of release zones, probability that the wind

blows in that direction. I don't think I need to read the rest of them.

But clearly, this book advocates the use of meteorological conditions in the preparation of a risk analysis. There is another passage in here which unfortunately I don't think I have marked, but it also makes recommendations on the number of meteorological conditions that you would include in both the screening and refined risk analysis.

Specifically, it lists for a screening analysis that you can use one meteorological condition, and in a refined analysis you would typically include two meteorological conditions, which in this case I'm referring to wind speed and stability class. One representative daytime, one representative of night-time conditions, as well as distribution of those conditions by direction.

Q I guess that brings us to another topic. Staff in their testimony reduced the -- you have stated that you agreed with their probability analysis. They multiplied the catastrophic tank failure probability by the probability of the worst case met conditions, which was 2.04 percent of the time.

A Right.

Q Is -- are the worst case met conditions the only conditions under which ammonia concentrations would exceed 75 ppm at Elk Hills Road, or are there a variety of met conditions that could lead to that?

A Well, clearly there's a -- a variety of conditions that could cause that to occur. What I did is I concurred really with staff's results. While they could've included more meteorological conditions, I do believe that their results are correct in terms of the level of significance, which they stated is insignificant.

Q So you're not necessarily agreeing with the number that they came up with?

A Well, I probably -- I think if you put a bunch of us in different rooms we'd all come up with slightly different numbers and use slightly different techniques. But I think for a screen analysis what they did is probably okay, given that the hazards associated with a much -- the hazards associated or the consequences associated with a release under different meteorological conditions would be considerably smaller.

Q You -- well, but in their -- they came up with a probability of catastrophic tank

failure, what they were assessing at that point was catastrophic tank failure multiplied by the percentage of met conditions.

A Could you say that again?

Q They -- if you've got a catastrophic tank failure, and you're trying to figure out what percentage of the time that tank failure is going to result in a significant impact, here, staff has used 75 ppm. If you're going to do an adequate probability analysis of what percentage of the time you would -- a catastrophic tank -- under this scenario, you have the catastrophic tank failure, would result in 75 ppm at the fence line, shouldn't you look at more met conditions than just the worst case met condition to evaluate whether or not you could get 75 ppm under a -- a bigger percentage of the time you have different met conditions?

A Well, I -- first of all, I would disagree that you would use 75 ppm as -- alone, as a significance criteria. The staff requested a wide variety of concentrations that they would evaluate the results of. And when you look at the length of a hazard zone, or a much higher concentration under the worst case condition,

knowing that hazard zones and different conditions would be considerably less, then staff was correct in how they have done a screening analysis to evaluate the overall probability of fatality or injury.

In addition, just the probability of a catastrophic tank failure is already lower than the acceptable probability of a fatality. I, you know, again, the United Kingdom Health and Safety executive uses a value of one times ten to the minus three as an acceptable -- or acceptable probability of fatality. Santa Barbara County uses one times ten to the minus four, and here we're in the one times ten to the minus five just for the release event, without accounting for wind direction, wind speed, meteorological conditions, and without accounting for the dose response relationship of the individuals exposed.

Q So you disagree with staff's standard of significant for probability, and standard of significance for parts per million exposure?

A I'm not sure that staff uses 75 ppm as the sole measure of significance. Seventy-five ppm in and of its own doesn't really mean much of anything except that you've got probably a lot of

people that are a little bit angry at that exposure. They're not going to be comfortable.

Q Did -- in the Applicant's analysis of consequences that would happen, if there's a catastrophic tank failure, what would be the exposure of people at Elk Hills Road, let's pick, because that's the nearest public receptor point. For the general public. I'm not talking about offsite workers now.

Your -- or, I don't know if you prepared it, but the Applicant's risk analysis showed that the levels of exposure at Elk Hills Road would exceed 20,000 parts per million if a catastrophic tank failure occurred. Is that correct?

I believe that's in response to staff Data Request 9 or 10.

A Yeah, I don't know the exact -- I don't know the exact value, but I could assume that it would be relatively high.

Q So if we get over 20,000 parts per million at Elk Hills Road under worst case met conditions, is it a reasonable assumption to make that there may be a wide range of meteorological conditions that could result in -- say even if you used the lethality measure of 2,000 parts per

million, could there be other met conditions other than the worst case 2.04 percent of the time, met conditions that could lead to more than the lethality concentration at Elk Hills?

A There could be other conditions.

Q Do you have any idea what the probability -- what that met data probability is?

A Not off the top of my head. The -- again, even if you multiply -- or even if you don't multiply the meteorological probability, the risk is considered acceptable. If you were to multiply in the probability of a certain --

Q Can we clarify that? Acceptable to whom?

A Well, acceptable based on established guidelines that have been accepted both in this country and in Europe.

Q But you're not -- you're not saying acceptable under staff's significance standard?

A I'm not sure that --

MS. LUCKHARDT: I believe he's already answered this question --

THE WITNESS: Yeah.

MS. LUCKHARDT: -- as far as staff's significance standard. I think you -- this

question has been asked and answered. She's asked previously about --

COMMISSIONER MOORE: Actually, I'm -- I'm going to concur. Where are you going, Counsel? And -- and --

MS. REYNOLDS: I can move on.

COMMISSIONER MOORE: Good.

MS. REYNOLDS: Okay.

COMMISSIONER MOORE: It's time.

MS. REYNOLDS: Let me see -- I think that's all I have for Applicant's witnesses.

HEARING OFFICER WILLIAMS: Do you have any redirect?

MS. LUCKHARDT: Give me just a second, I'll see if there's anything.

COMMISSIONER MOORE: Staff want to redirect?

MS. WILLIS: No.

MS. LUCKHARDT: No questions.

HEARING OFFICER WILLIAMS: Okay. Does that conclude the presentation?

MS. LUCKHARDT: Yes, it does.

HEARING OFFICER WILLIAMS: Do we have the exhibits in?

MS. LUCKHARDT: I believe we entered

those earlier. If we haven't I will offer them again.

HEARING OFFICER WILLIAMS: I think we do. Okay.

MS. LUCKHARDT: Or offer them now.

HEARING OFFICER WILLIAMS: I believe they were admitted.

Okay. Staff.

MS. WILLIS: At this time we'd like to call Rick Tyler and Joseph Loyer.

HEARING OFFICER WILLIAMS: I don't believe that --

MS. WILLIS: I believe Mr. Loyer needs to be sworn in.

HEARING OFFICER WILLIAMS: Would you swear the witness, please.

(Thereupon, Joseph Loyer was, by the reporter, sworn to tell the truth, the whole truth, and nothing but the truth.)

TESTIMONY OF

RICK TYLER AND JOSEPH LOYER

called as witnesses on behalf of the Commission staff, having been first duly sworn, were examined and testified as follows:

DIRECT EXAMINATION

MS. WILLIS: And could you please state your name for the record?

MR. LOYER: Joseph Michael Loyer.

MS. WILLIS: And did you prepare the section of the Final Staff Assessment entitled Hazardous Materials Management?

MR. LOYER: Yes, I did.

MS. WILLIS: And that has been previously identified as part of Exhibit 19. Did you also include in Exhibit 19 a statement of your qualifications?

MR. LOYER: Yes, I did.

MS. WILLIS: Do you have any changes or corrections to your testimony today?

MR. LOYER: Yes, I do.

MS. WILLIS: And I believe it has been previously -- if -- has it been marked, I believe it's 21-D.

HEARING OFFICER WILLIAMS: That's correct.

MS. WILLIS: Thank you.

And with these changes are the facts contained in your testimony true and correct?

MR. LOYER: Yes, they are.

MS. WILLIS: And do the opinions contained in your testimony represent your best professional judgment?

MR. LOYER: Yes, they do.

MS. WILLIS: Before we go along I'd like to address Mr. Tyler.

Could you please state your name for the record?

MR. TYLER: Rick Tyler.

MS. WILLIS: And did you prepare or assist in preparation of the Hazardous Materials Management section of the FSA?

MR. TYLER: Yes, I assisted in the preparation of --

HEARING OFFICER WILLIAMS: Counsel, can I stop you for just a moment.

I want to note for the record that Commissioner Moore had to leave momentarily. He will be returning. Does any party have any objection to proceeding without him?

MS. REYNOLDS: No.

HEARING OFFICER WILLIAMS: No objection.

MS. WILLIS: No objection.

HEARING OFFICER WILLIAMS: Okay. The other thing I wanted to clarify with respect to

the exhibits is that I think -- let's go off the record for just a second.

(Off the record.)

HEARING OFFICER WILLIAMS: Counsel, do you need Ms. Fox here?

MS. REYNOLDS: She just ran to the bathroom real quick. I think we'll be okay.

HEARING OFFICER WILLIAMS: Okay.

MS. WILLIS: Just for the record, the changes to Mr. Loyer's testimony is now Exhibit 21-F. Okay.

Mr. Tyler, did you include in Exhibit 19 a statement of your qualifications?

MR. TYLER: Yes, I believe so.

MS. WILLIS: Okay. And do the opinions contained in your testimony represent your best professional judgment?

MR. TYLER: Yes, they do.

MS. WILLIS: Mr. Loyer, would you please provide a summary of your testimony?

MR. LOYER: Beginning with the change in my testimony, or just starting with -- beginning with the change in my testimony.

MS. WILLIS: That's fine.

MR. LOYER: While reviewing the

Application for the Certification that was submitted by the Elk Hills Power Plant Applicant, staff originally misunderstood the intent of the Applicant in regards to the amount of hydrogen that would be stored onsite. It is the intent of the Applicant to store 60,000 cubic feet of hydrogen onsite, in addition to the 55,000 standard cubic feet that will be used in process for cooling the generators.

The proposed facility will be -- will consist of truck-mounted carbon steel tanks with a total capacity of 60,000 standard cubic feet, and a working pressure in the range of 2500 to 3500 psi. The tanks are subject to the American Society of Mechanical Engineers pressure vessel codes, as well as the Department of Transportation codes.

Without going into too much more detail about them, my supplemental testimony has, in addition, a condition of certification, Haz Mat 4, which describes the requirements for the hydrogen storage as consisting of truck -- truck-mounted steel tanks with a total capacity of 60,000 cubic feet, 2500 to 3500 psi working pressure, suitable for storing and transporting hydrogen. Will be

compliant with the ASME pressure vessel codes, as well as DOT codes. The tanks will be equipped with pressure relief valves. They will -- the site will include crash posts.

The storage site will be located at least 50 feet from any habitable structure, the combustion turbines and the anhydrous ammonia storage facility. The storage site will be placed in relation to the combustion turbines so that if an overspeed or accident occurs, it will not have significant potential to cause damage to the tanks.

And the detail of the procedure for connecting and disconnecting the hydrogen tanks will be included in the process safety management plan required by conditions Haz 2 and Haz 3. This condition includes a verification.

MS. WILLIS: Mr. Loyer, before you continue with the remainder of your summary, isn't it your understanding that the Applicant is in agreement with this condition?

MR. LOYER: Yes, that is my understanding.

MS. WILLIS: And now could you please provide a summary of the remainder of your

testimony.

MR. LOYER: The project is 500 megawatt natural gas-fired power plant with ammonia injection SCR, and oxidation catalyst. The hazardous materials stored onsite that will exceed the reportable amounts defined in the California Health and Safety Code are anhydrous ammonia, 25 -- 12,000 gallons potential.

Other materials that will be stored onsite include sodium hypochlorite, sulfuric acid, sodium hydroxide, hydrochloric acid, hydrogen, and natural gas, although natural gas will not be stored onsite. It will be used onsite.

Staff evaluated the aqueous ammonia facility -- I'm sorry, anhydrous ammonia facility, storage facility, and the testimony supplied by the Applicant for the offsite consequence analysis. Our conclusion is that the evaluation of hazardous materials handling and use for the proposed project indicate that the -- that they pose minimal potential of -- for significant impacts on the public.

With the addition of the proposed conditions of certification, Elk Hills will comply with all applicable LORS and will not pose a

potential for significant impact to the public health and safety from the handling of hazardous materials.

And that's the summary of my analysis.

MS. WILLIS: Mr. Tyler, do you have anything to add to the summary?

MR. TYLER: Yes. I'd like to first respond to some of the discussion that occurred earlier about staff's significance criteria, first off.

If you -- if you review Appendix A at the back of staff's testimony, there is a detailed discussion of various exposure criterias and -- and they're applicable to and how they should be used.

Staff does not use the 75 ppm criteria as significant. We've made that very clear. The 75 ppm criteria basically we view as a reasonable balance of risk and exposure. We believe that 75 ppm for a half an hour would potentially have irritating effects on healthy individuals, and could, according to the National Academy of Sciences, have some potential for more severe effects on sensitive individuals in the general population.

Again, that criteria is more or less our cutoff for de minimus. In other words, if it's below that, it's pretty much acceptable. We -- we don't worry about exposures below 75 ppm. Again, in this testimony the primary emphasis and the basis of our conclusion is that the risk of impact -- not occurrence -- of impact levels, are not sufficient to be considered significant.

Again, I would go back to the same discussion that was talked about earlier with -- with the criteria for various levels of risk versus impact. And to quote that same information as -- as we have previously, a risk of ten to the negative fourth would be considered acceptable for one fatality, a risk of ten to the negative five for up to ten fatalities, and a risk of ten to the negative up to a hundred fatalities.

So obviously, if this facility were located in the center of a highly populated area, the potential for a hundred fatalities could become very real. In this circumstance, where we have a -- an industrial facility with minimal number of people present, and large buffer zones to the nearest -- even residence, the nearest residence is over five miles away -- the potential

for any significant number of fatalities is -- is pretty low.

So that's -- that's the type of reasoning that led us to -- to come to the conclusion that this is -- that this is an acceptable risk.

The other thing I would like to talk about briefly is the idea of the EPA Cal-ARP program, or some of the other programs that were -- were talked about, and their inclusion of meteorological data.

The purpose of the CEQA analysis is determine if there's significant potential for impact. That is not the purpose of the analyses done under the Cal-ARP program or the EPA's program, or any of the other programs where the question was asked if they include those. Those types of -- ignoring those types of assumptions I believe would be completely appropriate in the context of emergency response planning.

If you want to know what's the worst possible outcome that I might have to deal with under any circumstance, and plan for that, then you would ignore those. Because obviously, it could occur. There's some limited probability.

But when you're assessing the significance, the potential significance, then we have to put risk in the context of potential impact.

And so our conclusion is -- is drawn upon that type of reasoning.

Another thing that I would like to talk about briefly is the issue of the -- the subsurface containment that's -- that's described as a potential mitigation measure.

Generally, it's widely -- or widely accepted and -- and the vast majority of experience with real releases of anhydrous ammonia are that they form jet releases. In other words, the material is jettisoned from the leak in a rapid -- much -- much the same as an aerosol can. So that's typically the type of release we get with a pressurized system with anhydrous ammonia when we have a leak. We get stuff basically aerosolized.

So it doesn't just drop out of the tank and fall into a -- into a basin and is neatly contained, as it might be with aqueous ammonia. In this case, the -- the efficacy of that type of control is -- is just not very viable. It's -- it's unlikely to be effective. So we wouldn't

recommend those types of -- of controls. So I -- I hope that more or less puts in context.

The other thing I would like to point out is that the risk of failure --

HEARING OFFICER WILLIAMS: When you say that kind of controls, what exactly are you referring to? I didn't follow. You seem to have made a segue there from the jettison of the ammonia, and I believe you're talking about subsurface containment.

MR. TYLER: Yes. The -- in other words, that type of mitigation is not likely to be effective in this circumstance. It -- we have required it in many other cases for aqueous ammonia. It's perfectly applicable and very effective for that type of -- of a release, because it's liquid, it's -- the emission is surface pool-driven by mass transfer. That isn't applicable here. Anhydrous ammonia doesn't -- that isn't an applicable mitigation here, in my opinion.

The other thing I would like to -- to discuss a little bit is -- is we used a -- a tank failure, catastrophic tank failure probability from the Richmond study that was described in

Frank Lees' book on loss prevention in the process industries. One of the things that I'd like to point out is that probability is -- is based on a set of faulty analysis. And I -- I'd like to read some of the things that they considered as -- as probable failure modes, and then discuss why we believe that -- that the facility that's being proposed here is even lower. So this is an upper bound risk, in our opinion, not -- not -- not lacking any conservativeness at all.

Support structure failure. Generally, and in this case this facility would be designed to --

MS. REYNOLDS: I'm sorry. Rick, can you point out the page that you're at?

MR. TYLER: That's page 8-13, I guess. In Volume 3. Yeah. At the bottom of Table A8.7. Okay. They discuss the fault tree that they used in considering some of those failures. The first one is -- is support failure. In other words, the vessel falls off its supports.

Those types of failures are -- are well addressed by the code, and certainly significantly addressed by seismic code, which this facility will have to be designed to.

Excess internal heat. Staff evaluated the presence of any flammable or explosive material in proximity to the tank. So that failure mode has been virtually eliminated by staff's evaluation of the project, and consideration of how it's laid out.

Excess pressure. Generally, excess pressure is associated with -- with -- the major cause of it is either external heat or from a fire, the same fault -- part of the same fault tree as the one above. Or, the tank is overfilled, and then as a result of expansion of the material after the tank is overfilled the tank becomes overpressurized. There -- obviously, they included the issue of the excess flow -- or the pressure relief valve's working, which, by the way, are redundant, two separate independent pressure relief valves.

But what they haven't calculated in here is the effect of major administrative controls that are now required under existing regulatory programs such as Cal-ARP, and PSM. PSM clearly requires that we evaluate delivery procedures and that -- that we try to minimize events such as overfilling. And so to the extent that these --

that these failures didn't reflect that type of regulation, we believe that that's been addressed to a large extent, as well, by -- by the regulatory programs that'll be applicable to this facility.

And then they give overfilling with liquid again, the same issue as I just stated.

Chemically incompatible materials. Again, addressed by staff's conditions, as well as -- as the -- as well as existing PSM programs and -- and other regulatory programs.

Mechanical defects. I would point out that worldwide pressure vessel codes are voluntary. In this country, they are mandatory. So you must comply with the ASME pressure vessel code in this country. Pressure vessel codes in other countries are left more or less to the discretion of the builder of the facility, or the operator of the facility.

So to the extent that this reflects worldwide experience, it overestimates the probability of failure that would be implicit in vessels built to United States codes. And in fact, our failure rates are lower in this country.

Stress corrosion cracking. Stress

corrosion cracking has been addressed to a large extent by the current ASME pressure vessel code. The one failure I am aware of where stress corrosion cracking caused a catastrophic failure of a vessel was because it had cold formed ends and there was a weld repair done on the vessel to address the stress corrosion crack. As a result of that, the codes have been changed to require hot formed ends, or if you do any welding on the -- on a cold form end, you have to stress relieve -- you have to heat treat the area pre- and post-weld, according to codes.

So the issue of stress corrosion cracking that's implicit in this dataset is also largely addressed by current U.S. codes.

Corrosive materials introduced from railcars I don't think is applicable here, but basically what I'm pointing out is the risk level that -- that we used I believe is very, very conservative in light of the regulatory programs and design of the pressure vessels that'll be used at this facility.

That's all I have at this time.

MS. WILLIS: At this time staff would like to introduce the section of the FSA entitled

Hazardous Materials Management into the record.

HEARING OFFICER WILLIAMS: Any objections?

MS. LUCKHARDT: No objection.

MS. REYNOLDS: No.

HEARING OFFICER WILLIAMS: So admitted.

(Thereupon, the Hazardous Materials Management section of Exhibit 19 were received into evidence.)

MS. WILLIS: And these witnesses are available for cross examination.

MS. LUCKHARDT: No questions.

MS. REYNOLDS: I have a few questions.

CROSS EXAMINATION

MS. REYNOLDS: Mr. Tyler, you stated that staff doesn't use the 75 ppm ammonia level as significant, and I'm curious about that because in the -- in your testimony, in the FSA, it states, if the exposure associated with a potential release would exceed 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact.

MR. TYLER: Poses a risk of significant impact. We would still have to evaluate, and I think we say that at the introduction of the

testimony, the probability of that occurring.

MS. REYNOLDS: So as far as parts per million exposure, aside from probability, is 75 ppm your significance level?

MR. TYLER: Seventy-five ppm I would be -- have -- that would be the level where I would start to have concern of a public receptor, not as defined by CURE for other workers onsite. That would have to be at the nearest residence.

MS. REYNOLDS: Is Elk Hills Road a public receptor --

MR. TYLER: Yes.

MS. REYNOLDS: -- location?

MR. TYLER: Yes, I would -- I would agree that that's a public receptor location. But I would not necessarily agree that 75 ppm in the passage of a car through that zone would be significant.

MS. REYNOLDS: Do you have a set -- so you can't state a specific parts per million exposure level that you would consider to be significant?

MR. TYLER: Not in the absence of probability of occurrence or duration of exposure.

MS. REYNOLDS: Okay. If there -- I'm

not talking about probability analysis here, I'm just talking about if -- if these things happened, if there was a catastrophic tank failure would you expect ammonia concentrations at Elk Hills Road to exceed 75 ppm?

MR. TYLER: Not necessarily. If the wind's blowing in the opposite direction of Elk Hills Road, there'll be -- there'll be no concentration on Elk Hills Road.

MS. REYNOLDS: In light of the fact that the Applicant's health risk -- I'm sorry, consequence analysis showed concentrations under worst case met conditions of over 20,000 parts per million, can you draw any conclusions as to what kind of met conditions would lead to less than 75 ppm at Elk Hills Road?

MR. TYLER: Yes. Any -- any -- anytime the wind blows in a direction that doesn't cross Elk Hills Road there would be no concentrations of ammonia on Elk Hills Road. And that's a significant probability.

MS. REYNOLDS: So do you know -- but you don't know the specific probability of that.

MR. TYLER: No, I didn't analyze that.

MS. REYNOLDS: Would it be greater than

2.04 percent?

MR. TYLER: I -- I don't know. Did you -- you did that actual calculation; correct?

MR. LOYER: Right. I did that actual calculation, so maybe I should go ahead and answer that.

MR. TYLER: Yeah.

MR. LOYER: Could you restate the question, please?

MS. REYNOLDS: Yes. What I'm trying to get is we've got staff saying that you're not going to have high concentrations at Elk Hills Road because of worst case met conditions at 2.04 percent.

MR. LOYER: And there are low probability --

MS. REYNOLDS: Are there other met conditions --

MR. LOYER: -- of the situation occurring.

MS. REYNOLDS: Are there other met conditions under which you could have -- if we had a catastrophic tank failure, you could have exceedences of 75 ppm at Elk Hills Road?

MR. LOYER: Are there other met

conditions under which --

MS. REYNOLDS: What -- what percentage of the time could you have met conditions; do you know that?

MR. LOYER: It's in the AFC. I don't have the number at my fingertips, but it is in the AFC, as to what percentage --

MS. REYNOLDS: The wind --

MR. LOYER: -- of the time the wind would blow in that direction.

MS. REYNOLDS: So the wind --

MR. LOYER: Now, unfortunately, that doesn't break it down enough for us to properly do the analysis. But it's -- as a first cut, you could do that.

MS. REYNOLDS: But you haven't done that actual analysis.

MR. LOYER: Well, I did it, but I didn't present it here because I didn't think it was relevant.

MS. REYNOLDS: And you don't recall what your results were?

MR. LOYER: Oh, no. You've got to remember, this is almost nine months ago. And about 14 feet of paper.

MS. REYNOLDS: We sympathize.

Are there other met conditions under which concentrations at Elk Hills Road could exceed the lethality level, which I think you've established at 2,000 parts per million?

MR. LOYER: Well, we didn't establish that, but the lethality level is 2,000 parts per million.

MS. REYNOLDS: Okay. So the answer to my question --

MR. LOYER: There are certainly met conditions under which you could, given a catastrophic release, get 2,000 and above ppm at Elk Hills Road. Yes.

MS. REYNOLDS: Would that be more than 2.04 percent of the time?

MR. LOYER: I don't believe so, no.

MS. REYNOLDS: So only under worst case met conditions would you get --

MR. LOYER: We're talking about F stability, and winds in the proper direction. And yes, my belief is that if we get anything above F stability we significantly drop the concentrations to a level that would be probably below the IDLH.

MS. REYNOLDS: So between the

Applicant's analysis of worst case met conditions at over 20,000 parts per million at Elk Hills Road --

MR. LOYER: I believe it was 28 --

MS. REYNOLDS: -- and -- yeah, 28,000 parts per million, and 2,000 parts per million at Elk Hills Road, there are no more met conditions other than that worst case that would get you in between the 2,000 and the 28,000 parts per million at Elk Hills Road.

MR. LOYER: I don't believe so, no.

MS. REYNOLDS: Have you done any calculations to support that belief?

MR. LOYER: Well, not specific to this case, no. But I have done those kinds of calculations in connection with air quality work.

MS. REYNOLDS: Okay.

MR. LOYER: Which is virtually the same models that -- that are used here, so.

MS. REYNOLDS: But you're speculating right now as to whether or not there would be any --

MR. LOYER: That is correct.

MS. REYNOLDS: Okay. Do you -- did you follow any government regulatory guidance when

conducting your probability analysis? Besides your own CEC.

MR. LOYER: No, I followed the recommended course of action from the Energy Commission that we have performed in past cases.

MS. REYNOLDS: Do accidents --

MR. LOYER: Of course, we -- we do -- we did follow some recommendations of other -- of other manuals, but mainly we were working on -- on what we have done in recent cases.

MS. REYNOLDS: Okay. Do accidents happen?

MR. LOYER: I don't know. Do they?

MS. REYNOLDS: I'm asking you.

MR. LOYER: Well, accidents happen all the time. Just ask Al Capone.

(Laughter.)

MS. REYNOLDS: That's all I have.

HEARING OFFICER WILLIAMS: Any redirect?

MS. WILLIS: No.

COMMISSIONER MOORE: Let me just say that we have a time issue that's -- that I was not aware of. While I have, oddly enough, time to continue this, my Hearing Officer can't stay beyond five o'clock. So my question to the CURE

Counsel is, can you get your case on from Dr. Fox by 5:00, 20 minutes. If yes -- she's shaking her head, which I'm --

MS. REYNOLDS: Not likely.

COMMISSIONER MOORE: -- subliminally interpreting as no.

MS. REYNOLDS: Not likely that I can finish in 20 minutes.

COMMISSIONER MOORE: Then what I'm going to do is to stop this, and go until Thursday, and then pick up with Dr. Fox's testimony and we'll simply -- we've got some time, I believe, on Thursday that will allow us to do this.

So with everyone's concurrence, I'm going to call time out. We'll pick this up again on Thursday.

HEARING OFFICER WILLIAMS: Is there any objection to doing that from any -- does that present a problem for anyone?

MS. LUCKHARDT: I -- I don't think so. I think it's -- I'm sorry, there were -- there was at least one other person talking to me when you were asking that. No, it --

COMMISSIONER MOORE: I'm sorry, Jane. I just assumed that when I said was there any

problem with it, that --

MS. LUCKHARDT: No.

COMMISSIONER MOORE: Okay.

HEARING OFFICER WILLIAMS: Well, I think, then, we can -- we can pick up on Thursday with the housekeeping issues, and we'll stand adjourned until Thursday.

(Thereupon, the Hearing was adjourned at 4:40 p.m.)

CERTIFICATE OF REPORTER

I, DEBI BAKER, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Hearing; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said Hearing, nor in any way interested in the outcome of said Hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 2nd day of February, 2000.

DEBI BAKER